



RF TEST REPORT

Applicant	Xiaomi Communications Co., Ltd.
FCC ID	2AFZZ119SG
Product	Mobile Phone
Brand	Redmi
Model	21121119SG
Report No.	R2109A0819-R2V1
Issue Date	November 15, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2020)/ FCC CFR 47 Part 24E (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	November 8, 2021
Rev.1	Update Extreme Temperature	November 15, 2021
Note: This revised report (Report No. R2109A0819-R2V1) supersedes and replaces the previously issued report (Report No. R2109A0819-R2). Please discard or destroy the previously issued report and dispose of it accordingly.		

Summary of measurement results

No.	Test Case	Clause in FCC rules	Verdict
1	RF Power Output and Effective Isotropic Radiated Power	2.1046 24.232(c)	PASS
2	Occupied Bandwidth	2.1049	PASS
3	Band Edge Compliance	2.1051 /24.238(a)	PASS
4	Peak-to-Average Power Ratio	24.232/KDB 971168 D01(5.7)	PASS
5	Frequency Stability	2.1055 / 24.235	PASS
6	Spurious Emissions at Antenna Terminals	2.1051 / 24.238(a)	PASS
7	Radiates Spurious Emission	2.1053 / 24.238(a)	PASS
Date of Testing: October 15, 2021~ October 21, 2021			
Date of Sample Received: September 30, 2021			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			



1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
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2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Xiaomi Communications Co., Ltd.
Applicant address	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer	Xiaomi Communications Co., Ltd.
Manufacturer address	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

2.2. General information

EUT Description			
Model	21121119SG		
IMEI	IMEI 1: 860406050010980 IMEI 2: 860406050010998		
Hardware Version	P2		
Software Version	MIUI12.5		
Antenna Type	PIFA Antenna		
Antenna Gain	Low Antenna	Upper Antenna	
	0 dBi	-0.4 dBi	
Test Mode(s)	GSM1900; WCDMA Band II; LTE Band 2;		
Test Modulation	(GSM/GPRS) GMSK, (EGPRS) GMSK/ 8PSK; (WCDMA) BPSK, QPSK,16QAM; (LTE) QPSK,16QAM,64QAM;		
GPRS Multislot Class	12		
EGPRS Multislot Class	12		
HSDPA UE Category	24		
HSUPA UE Category	7		
LTE Category	7		
Maximum E.I.R.P	GSM 1900:	29.95dBm	
	WCDMA Band II:	23.87dBm	
	LTE Band 2:	24.12dBm	
Rated Power Supply Voltage	3.87V		
Operating Voltage	Minimum:3.60V Maximum: 4.45V		
Operating Temperature	Lowest: -10°C Highest: +60°C		
Extreme Temperature	Lowest: -30°C Highest: +60°		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM1900	1850 ~ 1910	1930 ~ 1990
	WCDMA Band II	1850 ~ 1910	1930 ~ 1990



	LTE Band 2	1850 ~ 1910	1930 ~ 1990
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.			

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR 47 Part 24E (2020)

FCC CFR47 Part 2 (2020)

Reference standard:

ANSI C63.26 (2015)

KDB 971168 D01 Power Meas License Digital Systems v03r01

4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, horizontal polarization for GSM/WCDMA; X axis, horizontal polarization for LTE, Upper Antenna; Z axis, vertical polarization for LTE, Low Antenna) and the worst case was recorded.

All mode and data rates and positions and RB size and modulations were investigated.

Subsequently, only the worst case emissions are reported.

The following testing in GSM/WCDMA/LTE is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

Test items	Modes/Modulation	
	GSM 1900	WCDMA Band II
RF Power Output and Effective Isotropic Radiated Power	GSM GPRS EGPRS	RMC/ AMR HSDPA/HSUPA DC-HSDPA/HSPA+
Occupied Bandwidth	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Band Edge Compliance	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Peak-to-Average Power Ratio	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Frequency Stability	GSM GPRS(1Tx slot) EGPRS(1Tx slot)	RMC
Spurious Emissions at Antenna Terminals	GSM	RMC
Radiates Spurious Emission	GSM	RMC

Test modes are chosen to be reported as the worst case configuration below for LTE Band 2

Test items	Bandwidth (MHz)						Modulation		RB			Test Channel		
	1.4	3	5	10	15	20	QPSK	16QAM/ 64QAM	1	50%	100%	L	M	H
RF Power Output and Effective Isotropic Radiated Power	O	O	O	O	O	O	O	O	O	O	O	O	O	O



Occupied Bandwidth	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Band Edge Compliance	O	O	O	O	O	O	O	O	O	-	O	O	-	O
Peak-to-Average Power Ratio	O	O	O	O	O	O	O	O	-	-	O	O	O	O
Frequency Stability	O	O	O	O	O	O	O	O	O	-	-	-	O	-
Spurious Emissions at Antenna Terminals	O	O	O	O	O	O	O	-	O	-	-	O	O	O
Radiates Spurious Emission	O	-	O	-	-	O	O	-	O	-	-	-	O	-
Note	1. The mark "O" means that this configuration is chosen for testing. 2. The mark "-" means that this configuration is not testing.													

5. Test Case Results

5.1.RF Power Output and Effective Isotropic Radiated Power

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the Base Station Simulator with a known loss. The EUT is controlled by the Base Station Simulator test set to ensure max power transmission with proper modulation.

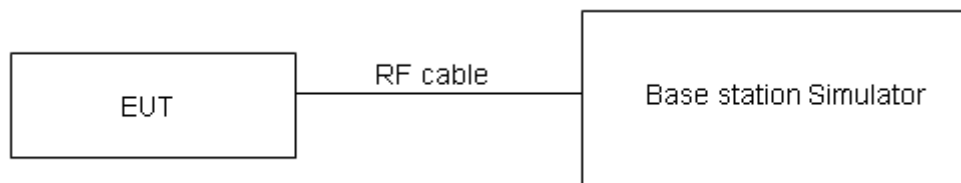
ERP can then be calculated as follows:

$EIRP \text{ (dBm)} = \text{Output Power (dBm)} - \text{Losses (dB)} + \text{Antenna Gain (dBi)}$

where:dBd refers to gain relative to an ideal dipole.

$EIRP \text{ (dBm)} = ERP \text{ (dBm)} + 2.15 \text{ (dB.)}$

Test Setup



Limits

No specific RF power output requirements in part 2.1046.

Rule Part 24.232(c) Mobile and portable stations are limited to 2 watts EIRP.

Rule Part 24.232(e) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Limit	$\leq 2 \text{ W}$ (33 dBm)
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4 \text{ dB}$ for RF power output, $k = 2$, $U = 1.19 \text{ dB}$ for EIRP.

Test Results

GSM 1900		Maximum Output Power (dBm)			EIRP (dBm) (Low Antenna)			EIRP (dBm) (Upper Antenna)		
		Channel 512	Channel 661	Channel 810	Channel 512	Channel 661	Channel 810	Channel 512	Channel 661	Channel 810
		1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)	1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)	1850.2 (MHz)	1880 (MHz)	1909.8 (MHz)
GSM	Results	29.95	29.74	29.47	29.95	29.74	29.47	29.55	29.34	29.07
GPRS/EGPRS (GMSK)	1TXslot	29.94	29.74	29.46	29.94	29.74	29.46	29.54	29.34	29.06
	2TXslots	29.23	29.00	28.74	29.23	29.00	28.74	28.83	28.60	28.34
	3TXslots	27.46	27.29	27.04	27.46	27.29	27.04	27.06	26.89	26.64
	4TXslots	26.47	26.25	25.98	26.47	26.25	25.98	26.07	25.85	25.58
EGPRS (8PSK)	1TXslot	25.73	25.67	25.71	25.73	25.67	25.71	25.33	25.27	25.31
	2TXslots	23.92	23.90	23.88	23.92	23.90	23.88	23.52	23.50	23.48
	3TXslots	21.95	22.16	22.03	21.95	22.16	22.03	21.55	21.76	21.63
	4TXslots	20.78	20.59	20.91	20.78	20.59	20.91	20.38	20.19	20.51

WCDMA Band II		Maximum Output Power (dBm)			EIRP (dBm) (Low Antenna)			EIRP (dBm) (Upper Antenna)		
		Channel 9262	Channel 9400	Channel 9538	Channel 9262	Channel 9400	Channel 9538	Channel 9262	Channel 9400	Channel 9538
		1852.4 (MHz)	1880 (MHz)	1907.6 (MHz)	1852.4 (MHz)	1880 (MHz)	1907.6 (MHz)	1852.4 (MHz)	1880 (MHz)	1907.6 (MHz)
RMC		23.70	23.73	23.70	23.70	23.73	23.70	23.30	23.33	23.30
AMR		23.56	23.87	23.74	23.56	23.87	23.74	23.16	23.47	23.34
HSDPA	Subtest 1	22.56	22.87	22.56	22.56	22.87	22.56	22.16	22.47	22.16
	Subtest 2	22.80	22.57	22.54	22.80	22.57	22.54	22.40	22.17	22.14
	Subtest 3	22.16	22.09	22.36	22.16	22.09	22.36	21.76	21.69	21.96
	Subtest 4	22.16	22.11	22.16	22.16	22.11	22.16	21.76	21.71	21.76
HSUPA	Subtest 1	21.86	21.63	21.76	21.86	21.63	21.76	21.46	21.23	21.36
	Subtest 2	21.22	21.23	21.32	21.22	21.23	21.32	20.82	20.83	20.92
	Subtest 3	22.04	22.39	22.16	22.04	22.39	22.16	21.64	21.99	21.76
	Subtest 4	20.76	20.73	20.68	20.76	20.73	20.68	20.36	20.33	20.28
	Subtest 5	22.24	22.11	22.14	22.24	22.11	22.14	21.84	21.71	21.74
DC-HSDPA	Subtest 1	22.72	22.63	22.86	22.72	22.63	22.86	22.32	22.23	22.46
	Subtest 2	22.66	22.85	22.72	22.66	22.85	22.72	22.26	22.45	22.32
	Subtest 3	22.12	22.37	22.06	22.12	22.37	22.06	21.72	21.97	21.66
	Subtest 4	22.28	22.17	22.12	22.28	22.17	22.12	21.88	21.77	21.72
HSPA+	16QAM	21.24	21.39	21.22	21.24	21.39	21.22	20.84	20.99	20.82



LTE Band 2				Maximum Output Power(dBm)			EIRP (dBm) (Low Antenna)			EIRP (dBm) (Upper Antenna)		
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18607/ 1850.7	18900/ 1880	19193/ 1909.3	18607/ 1850.7	18900/ 1880	19193/ 1909.3	18607/ 1850.7	18900/ 1880	19193/ 1909.3
1.4MHz	QPSK	1	0	24.06	23.97	24.01	24.06	23.97	24.01	23.66	23.57	23.61
		1	2	24.09	24.03	24.02	24.09	24.03	24.02	23.69	23.63	23.62
		1	5	23.86	23.84	23.88	23.86	23.84	23.88	23.46	23.44	23.48
		3	0	24.09	24.00	24.08	24.09	24.00	24.08	23.69	23.60	23.68
		3	2	23.99	24.07	24.12	23.99	24.07	24.12	23.59	23.67	23.72
		3	3	23.88	23.99	24.10	23.88	23.99	24.10	23.48	23.59	23.70
		6	0	23.09	23.06	23.28	23.09	23.06	23.28	22.69	22.66	22.88
	16QAM	1	0	23.21	23.18	23.24	23.21	23.18	23.24	22.81	22.78	22.84
		1	2	23.19	23.21	23.16	23.19	23.21	23.16	22.79	22.81	22.76
		1	5	22.99	23.07	23.05	22.99	23.07	23.05	22.59	22.67	22.65
		3	0	23.07	23.07	23.04	23.07	23.07	23.04	22.67	22.67	22.64
		3	2	22.94	22.97	23.04	22.94	22.97	23.04	22.54	22.57	22.64
		3	3	22.89	23.03	22.96	22.89	23.03	22.96	22.49	22.63	22.56
		6	0	21.91	22.04	22.11	21.91	22.04	22.11	21.51	21.64	21.71
	64QAM	1	0	21.99	22.01	21.96	21.99	22.01	21.96	21.59	21.61	21.56
		1	2	21.91	21.85	21.89	21.91	21.85	21.89	21.51	21.45	21.49
		1	5	22.08	22.08	22.09	22.08	22.08	22.09	21.68	21.68	21.69
		3	0	21.88	21.81	21.85	21.88	21.81	21.85	21.48	21.41	21.45
		3	2	21.86	21.78	21.83	21.86	21.78	21.83	21.46	21.38	21.43
		3	3	21.96	21.93	21.92	21.96	21.93	21.92	21.56	21.53	21.52
		6	0	20.96	20.95	20.98	20.96	20.95	20.98	20.56	20.55	20.58
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18615/ 1851.5	18900/ 1880	19185/ 1908.5	18615/ 1851.5	18900/ 1880	19185/ 1908.5	18615/ 1851.5	18900/ 1880	19185/ 1908.5
3MHz	QPSK	1	0	24.08	24.01	24.04	24.08	24.01	24.04	23.68	23.61	23.64
		1	7	24.07	24.06	24.06	24.07	24.06	24.06	23.67	23.66	23.66
		1	14	23.89	23.89	23.92	23.89	23.89	23.92	23.49	23.49	23.52
		8	0	23.19	23.12	23.21	23.19	23.12	23.21	22.79	22.72	22.81
		8	4	23.11	23.17	23.24	23.11	23.17	23.24	22.71	22.77	22.84
		8	7	22.98	23.10	23.20	22.98	23.10	23.20	22.58	22.70	22.80
		15	0	23.09	23.10	23.31	23.09	23.10	23.31	22.69	22.70	22.91
	16QAM	1	0	23.24	23.20	23.27	23.24	23.20	23.27	22.84	22.80	22.87



		1	7	23.22	23.21	23.20	23.22	23.21	23.20	22.82	22.81	22.80
		1	14	23.01	23.11	23.08	23.01	23.11	23.08	22.61	22.71	22.68
		8	0	22.18	22.20	22.16	22.18	22.20	22.16	21.78	21.80	21.76
		8	4	22.05	22.10	22.16	22.05	22.10	22.16	21.65	21.70	21.76
		8	7	21.99	22.15	22.09	21.99	22.15	22.09	21.59	21.75	21.69
		15	0	21.94	22.08	22.14	21.94	22.08	22.14	21.54	21.68	21.74
		15	0	21.94	22.08	22.14	21.94	22.08	22.14	21.54	21.68	21.74
	64QAM	1	0	22.02	22.03	21.99	22.02	22.03	21.99	21.62	21.63	21.59
		1	7	21.94	21.85	21.91	21.94	21.85	21.91	21.54	21.45	21.51
		1	14	22.10	22.07	22.12	22.10	22.07	22.12	21.70	21.67	21.72
		8	0	20.99	20.94	20.97	20.99	20.94	20.97	20.59	20.54	20.57
		8	4	20.97	20.91	20.95	20.97	20.91	20.95	20.57	20.51	20.55
		8	7	21.06	21.05	21.05	21.06	21.05	21.05	20.66	20.65	20.65
		15	0	20.99	20.99	21.01	20.99	20.99	21.01	20.59	20.59	20.61
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18625/ 1852.5	18900/ 1880	19175/ 1907.5	18625/ 1852.5	18900/ 1880	19175/ 1907.5	18625/ 1852.5	18900/ 1880	19175/ 1907.5
5MHz	QPSK	1	0	24.05	23.99	24.00	24.05	23.99	24.00	23.65	23.59	23.60
		1	13	24.05	24.02	24.03	24.05	24.02	24.03	23.65	23.62	23.63
		1	24	23.86	23.84	23.88	23.86	23.84	23.88	23.46	23.44	23.48
		12	0	23.16	23.07	23.17	23.16	23.07	23.17	22.76	22.67	22.77
		12	6	23.09	23.13	23.19	23.09	23.13	23.19	22.69	22.73	22.79
		12	13	22.96	23.08	23.16	22.96	23.08	23.16	22.56	22.68	22.76
		25	0	23.09	23.09	23.29	23.09	23.09	23.29	22.69	22.69	22.89
	16QAM	1	0	23.21	23.16	23.24	23.21	23.16	23.24	22.81	22.76	22.84
		1	13	23.19	23.19	23.17	23.19	23.19	23.17	22.79	22.79	22.77
		1	24	22.98	23.09	23.04	22.98	23.09	23.04	22.58	22.69	22.64
		12	0	22.16	22.16	22.13	22.16	22.16	22.13	21.76	21.76	21.73
		12	6	22.02	22.05	22.12	22.02	22.05	22.12	21.62	21.65	21.72
		12	13	21.96	22.10	22.05	21.96	22.10	22.05	21.56	21.70	21.65
		25	0	21.92	22.04	22.09	21.92	22.04	22.09	21.52	21.64	21.69
	64QAM	1	0	21.99	22.03	21.96	21.99	22.03	21.96	21.59	21.63	21.56
		1	13	21.91	21.87	21.88	21.91	21.87	21.88	21.51	21.47	21.48
		1	24	22.11	22.05	22.08	22.11	22.05	22.08	21.71	21.65	21.68
		12	0	20.97	20.90	20.98	20.97	20.90	20.98	20.57	20.50	20.58
		12	6	20.94	20.86	20.91	20.94	20.86	20.91	20.54	20.46	20.51
		12	13	21.03	21.00	21.01	21.03	21.00	21.01	20.63	20.60	20.61
		25	0	20.97	20.95	20.96	20.97	20.95	20.96	20.57	20.55	20.56



BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18650/ 1855	18900/ 1880	19150/ 1905	18650/ 1855	18900/ 1880	19150/ 1905	18650/ 1855	18900/ 1880	19150/ 1905
10MHz	QPSK	1	0	24.07	24.00	24.03	24.07	24.00	24.03	23.67	23.60	23.63
		1	25	24.08	24.07	24.07	24.08	24.07	24.07	23.68	23.67	23.67
		1	49	23.88	23.88	23.91	23.88	23.88	23.91	23.48	23.48	23.51
		25	0	23.19	23.12	23.21	23.19	23.12	23.21	22.79	22.72	22.81
		25	13	23.12	23.18	23.23	23.12	23.18	23.23	22.72	22.78	22.83
		25	25	22.98	23.12	23.21	22.98	23.12	23.21	22.58	22.72	22.81
		50	0	23.13	23.11	23.33	23.13	23.11	23.33	22.73	22.71	22.93
	16QAM	1	0	23.23	23.19	23.26	23.23	23.19	23.26	22.83	22.79	22.86
		1	25	23.22	23.23	23.20	23.22	23.23	23.20	22.82	22.83	22.80
		1	49	23.01	23.11	23.07	23.01	23.11	23.07	22.61	22.71	22.67
		25	0	22.19	22.21	22.17	22.19	22.21	22.17	21.79	21.81	21.77
		25	13	22.04	22.09	22.15	22.04	22.09	22.15	21.64	21.69	21.75
		25	25	21.99	22.15	22.09	21.99	22.15	22.09	21.59	21.75	21.69
		50	0	21.95	22.09	22.13	21.95	22.09	22.13	21.55	21.69	21.73
	64QAM	1	0	22.01	22.02	21.98	22.01	22.02	21.98	21.61	21.62	21.58
		1	25	21.94	21.87	21.91	21.94	21.87	21.91	21.54	21.47	21.51
		1	49	22.10	22.07	22.11	22.10	22.07	22.11	21.70	21.67	21.71
		25	0	21.00	20.95	20.98	21.00	20.95	20.98	20.60	20.55	20.58
		25	13	20.96	20.90	20.94	20.96	20.90	20.94	20.56	20.50	20.54
		25	25	21.06	21.05	21.05	21.06	21.05	21.05	20.66	20.65	20.65
		50	0	21.00	21.00	21.00	21.00	21.00	21.00	20.60	20.60	20.60
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18675/ 1857.5	18900/ 1880	19125/ 1902.5	18675/ 1857.5	18900/ 1880	19125/ 1902.5	18675/ 1857.5	18900/ 1880	19125/ 1902.5
15MHz	QPSK	1	0	24.06	23.96	24.01	24.06	23.96	24.01	23.66	23.56	23.61
		1	38	24.06	24.06	24.04	24.06	24.06	24.04	23.66	23.66	23.64
		1	74	23.85	23.83	23.87	23.85	23.83	23.87	23.45	23.43	23.47
		36	0	23.17	23.08	23.18	23.17	23.08	23.18	22.77	22.68	22.78
		36	18	23.09	23.13	23.19	23.09	23.13	23.19	22.69	22.73	22.79
		36	39	22.95	23.09	23.17	22.95	23.09	23.17	22.55	22.69	22.77
		75	0	23.11	23.07	23.28	23.11	23.07	23.28	22.71	22.67	22.88
	16QAM	1	0	23.18	23.17	23.24	23.18	23.17	23.24	22.78	22.77	22.84
		1	38	23.20	23.20	23.18	23.20	23.20	23.18	22.80	22.80	22.78
		1	74	22.98	23.07	23.04	22.98	23.07	23.04	22.58	22.67	22.64



		36	0	22.16	22.19	22.14	22.16	22.19	22.14	21.76	21.79	21.74
		36	18	22.01	22.04	22.11	22.01	22.04	22.11	21.61	21.64	21.71
		36	39	21.97	22.11	22.06	21.97	22.11	22.06	21.57	21.71	21.66
		75	0	21.92	22.04	22.09	21.92	22.04	22.09	21.52	21.64	21.69
	64QAM	1	0	21.96	22.00	21.96	21.96	22.00	21.96	21.56	21.60	21.56
		1	38	21.92	21.84	21.89	21.92	21.84	21.89	21.52	21.44	21.49
		1	74	22.11	22.06	22.12	22.11	22.06	22.12	21.71	21.66	21.72
		36	0	20.99	20.97	20.99	20.99	20.97	20.99	20.59	20.57	20.59
		36	18	20.94	20.87	20.93	20.94	20.87	20.93	20.54	20.47	20.53
		36	39	21.04	21.01	21.02	21.04	21.01	21.02	20.64	20.61	20.62
		75	0	20.97	20.95	20.96	20.97	20.95	20.96	20.57	20.55	20.56
BW	Modulation	RB size	RB offset	Channel/Frequency(MHz)								
				18700/ 1860	18900/ 1880	19100/ 1900	18700/ 1860	18900/ 1880	19100/ 1900	18700/ 1860	18900/ 1880	19100/ 1900
20MHz	QPSK	1	0	24.03	23.92	23.98	24.03	23.92	23.98	23.63	23.52	23.58
		1	50	24.05	24.02	24.02	24.05	24.02	24.02	23.65	23.62	23.62
		1	99	23.83	23.82	23.84	23.83	23.82	23.84	23.43	23.42	23.44
		50	0	23.14	23.03	23.14	23.14	23.03	23.14	22.74	22.63	22.74
		50	25	23.07	23.09	23.16	23.07	23.09	23.16	22.67	22.69	22.76
		50	50	22.92	23.04	23.13	22.92	23.04	23.13	22.52	22.64	22.73
		100	0	23.08	23.02	23.24	23.08	23.02	23.24	22.68	22.62	22.84
	16QAM	1	0	23.11	23.13	23.19	23.11	23.13	23.19	22.71	22.73	22.79
		1	50	23.16	23.18	23.14	23.16	23.18	23.14	22.76	22.78	22.74
		1	99	22.96	23.04	23.02	22.96	23.04	23.02	22.56	22.64	22.62
		50	0	22.13	22.15	22.11	22.13	22.15	22.11	21.73	21.75	21.71
		50	25	21.98	22.02	22.08	21.98	22.02	22.08	21.58	21.62	21.68
		50	50	21.94	22.06	22.02	21.94	22.06	22.02	21.54	21.66	21.62
		100	0	21.90	22.00	22.06	21.90	22.00	22.06	21.50	21.60	21.66
	64QAM	1	0	21.94	21.96	21.91	21.94	21.96	21.91	21.54	21.56	21.51
		1	50	21.88	21.82	21.85	21.88	21.82	21.85	21.48	21.42	21.45
		1	99	22.05	22.00	22.06	22.05	22.00	22.06	21.65	21.60	21.66
		50	0	20.94	20.89	20.92	20.94	20.89	20.92	20.54	20.49	20.52
		50	25	20.90	20.83	20.87	20.90	20.83	20.87	20.50	20.43	20.47
		50	50	21.01	20.96	20.98	21.01	20.96	20.98	20.61	20.56	20.58
		100	0	20.95	20.91	20.93	20.95	20.91	20.93	20.55	20.51	20.53

5.2.Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

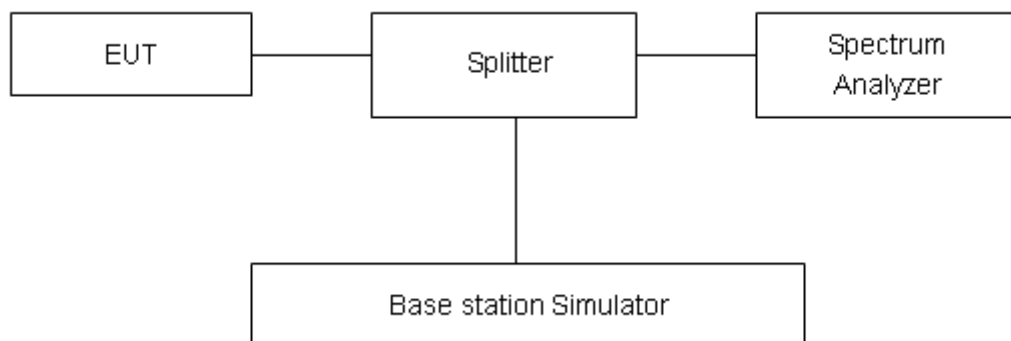
Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer.

RBW is set to $\geq 1\%EBW$, VBW is set to 3x RBW.

99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

No specific occupied bandwidth requirements in part 2.1049.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 624\text{Hz}$.

Test Result

Mode	Channel	Frequency (MHz)	99% Power Bandwidth (MHz)	-26dBc Bandwidth(MHz)
GSM 1900 (GMSK)	512	1850.2	0.248	0.309
	661	1880.0	0.251	0.313
	810	1909.8	0.251	0.318
GPRS 1900 (GMSK)	512	1850.2	0.246	0.322
	661	1880.0	0.246	0.319
	810	1909.8	0.240	0.311
EGPRS 1900 (8PSK)	512	1850.2	0.241	0.302
	661	1880.0	0.244	0.305
	810	1909.8	0.245	0.307
WCDMA Band II (RMC)	9262	1852.4	4.163	4.688
	9400	1880	4.163	4.688
	9538	1907.6	4.162	4.673

LTE Band 2						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	18607	1850.7	1.092	1.265
			18900	1880.0	1.094	1.274
			19193	1909.3	1.095	1.283
		3	18615	1851.5	2.689	2.927
			18900	1880	2.704	2.934
			19185	1908.5	2.694	2.917
		5	18625	1852.5	4.514	4.876
			18900	1880	4.511	4.889
			19175	1907.5	4.505	4.892
		10	18650	1855	8.985	9.659
			18900	1880	9.011	9.672
			19150	1905	9.015	9.637
		15	18675	1857.5	13.463	14.667
			18900	1880	13.438	14.624
			19125	1902.5	13.439	14.641
		20	18700	1860	17.982	19.329
			18900	1880	17.943	19.216



	16QAM	1.4	19100	1900	17.941	19.159
			18607	1850.7	1.097	1.279
			18900	1880.0	1.101	1.303
			19193	1909.3	1.088	1.263
		3	18615	1851.5	2.683	2.920
			18900	1880	2.685	2.932
			19185	1908.5	2.682	2.886
		5	18625	1852.5	4.501	4.932
			18900	1880	4.498	4.861
			19175	1907.5	4.504	4.852
		10	18650	1855	8.977	9.714
			18900	1880	8.976	9.775
			19150	1905	8.995	9.735
		15	18675	1857.5	13.429	14.453
			18900	1880	13.474	14.529
			19125	1902.5	13.474	14.408
		20	18700	1860	17.943	19.376
			18900	1880	17.981	19.365
			19100	1900	17.950	19.241
	64QAM	1.4	18607	1850.7	1.097	1.288
			18900	1880.0	1.098	1.297
			19193	1909.3	1.087	1.280
		3	18615	1851.5	2.681	2.952
			18900	1880	2.687	2.912
			19185	1908.5	2.688	2.908
		5	18625	1852.5	4.497	4.952
			18900	1880	4.502	4.887
			19175	1907.5	4.524	4.897
		10	18650	1855	8.968	9.645
			18900	1880	8.994	9.660
			19150	1905	8.995	9.676
		15	18675	1857.5	13.442	14.542
			18900	1880	13.463	14.545
			19125	1902.5	13.467	14.422
		20	18700	1860	17.994	19.329
			18900	1880	17.948	19.373
			19100	1900	17.988	19.152

GSM1900 GSM CH-Low



GSM1900 GPRS CH-Low



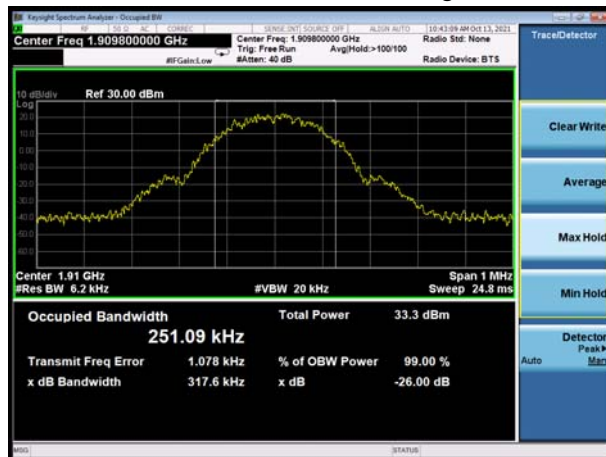
GSM 1900 GSM CH-Middle



GSM 1900 GPRS CH-Middle



GSM 1900 GSM CH-High



GSM 1900 GPRS CH-High



GSM1900 EGPRS CH-Low



WCDMA Band II RMC CH-LOW



GSM 1900 EGPRS CH-Middle



WCDMA Band II RMC CH-Middle



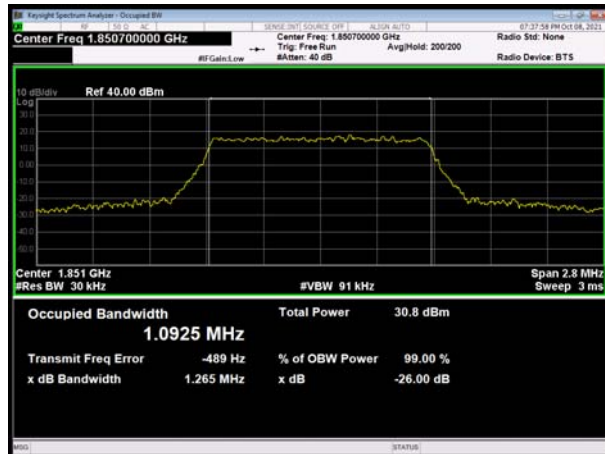
GSM 1900 EGPRS CH-High



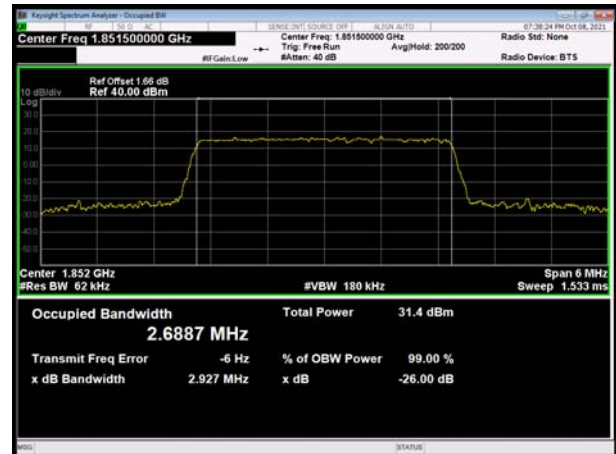
WCDMA Band II RMC CH-High



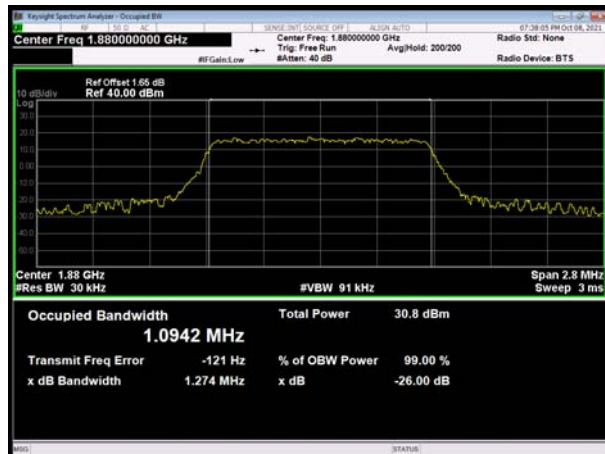
LTE Band 2 1.4MHz QPSK CH-Low



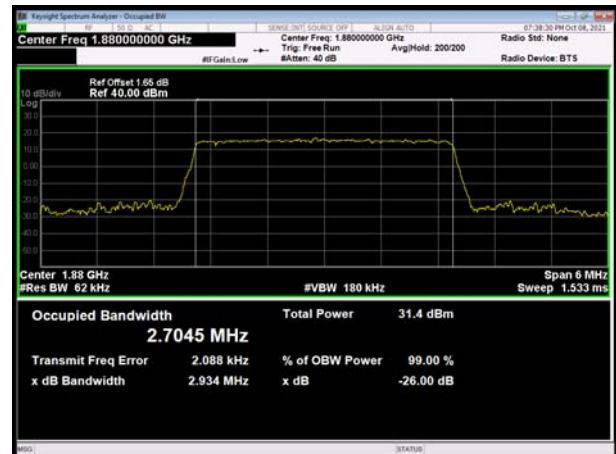
LTE Band 2 3MHz QPSK CH-Low



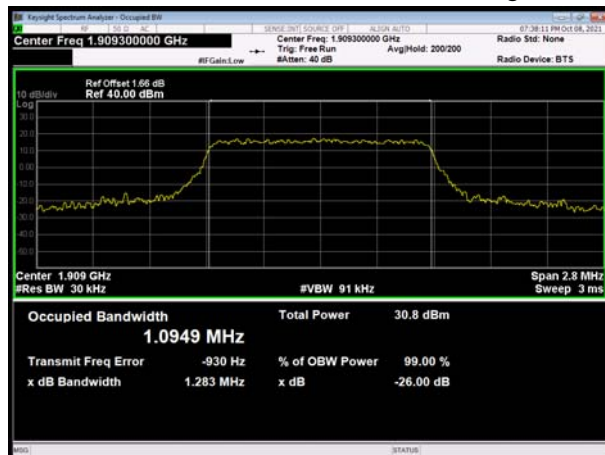
LTE Band 2 1.4MHz QPSK CH-Middle



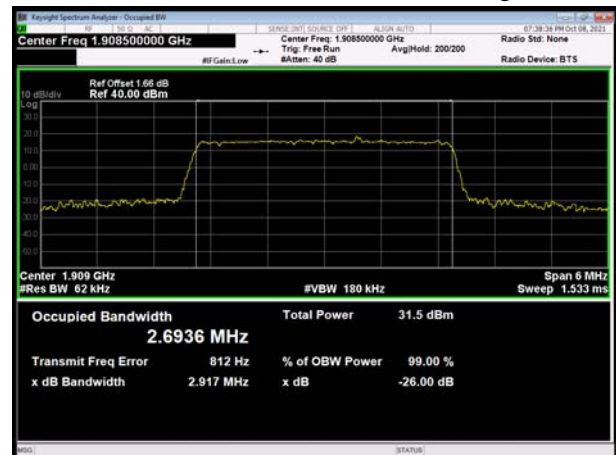
LTE Band 2 3MHz QPSK CH-Middle



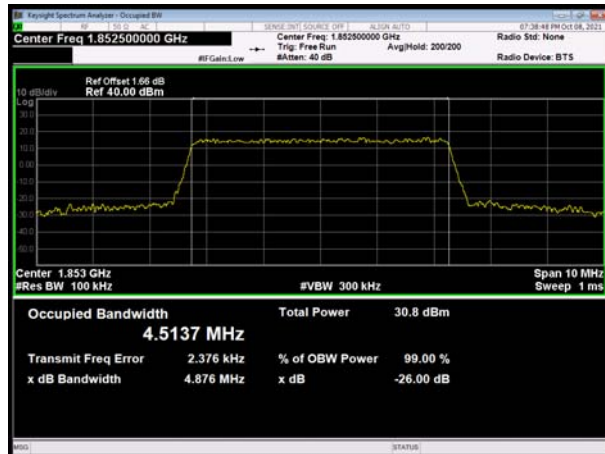
LTE Band 2 1.4MHz QPSK CH-High



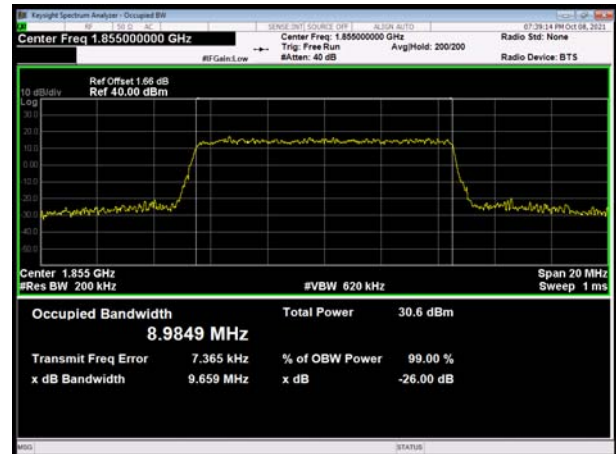
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LTE Band 2 5MHz QPSK CH-Low



LTE Band 2 10MHz QPSK CH-Low



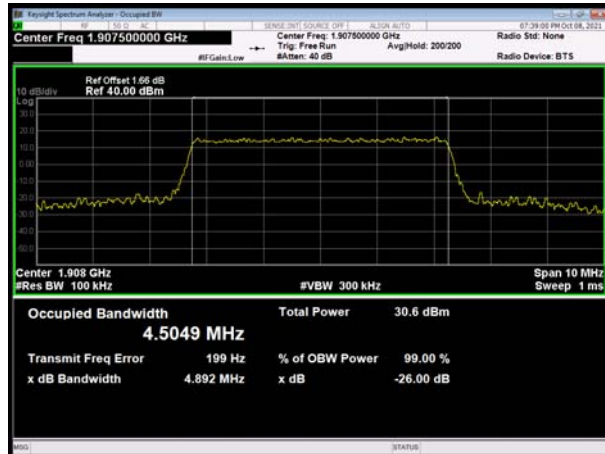
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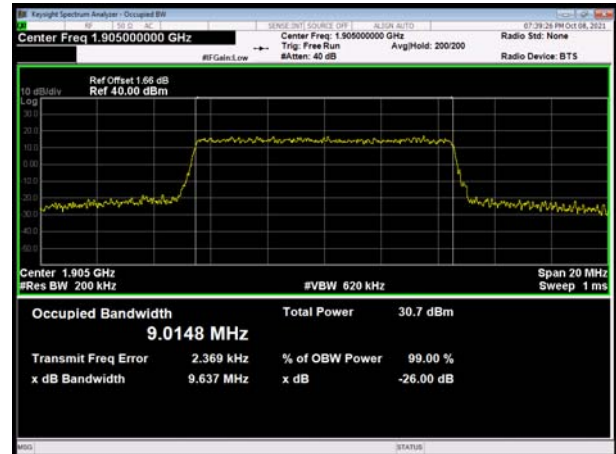
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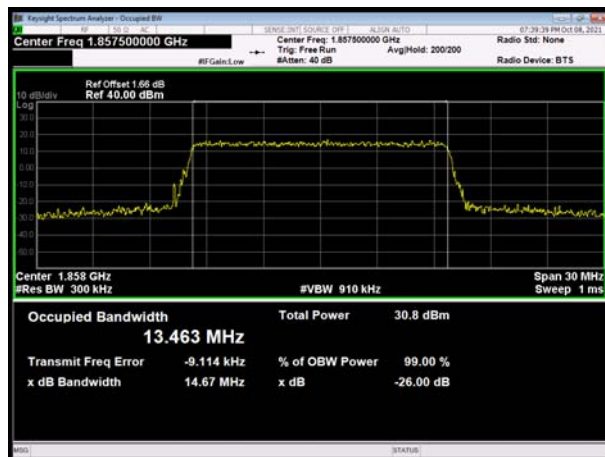
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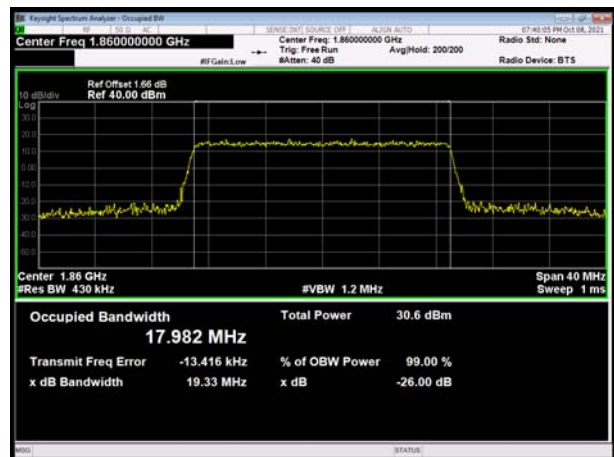
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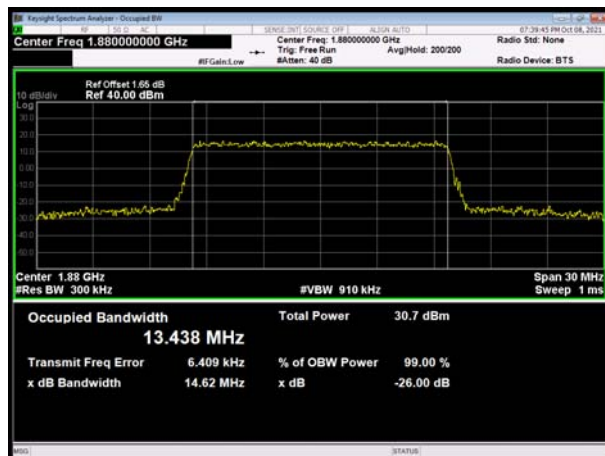
LTE Band 2 15MHz QPSK CH-Low



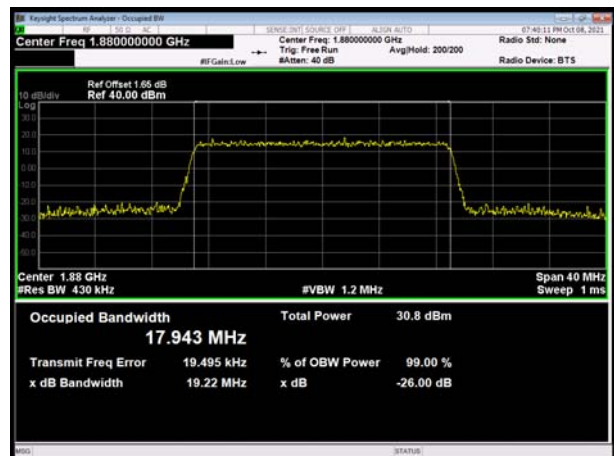
LTE Band 2 20MHz QPSK CH-Low



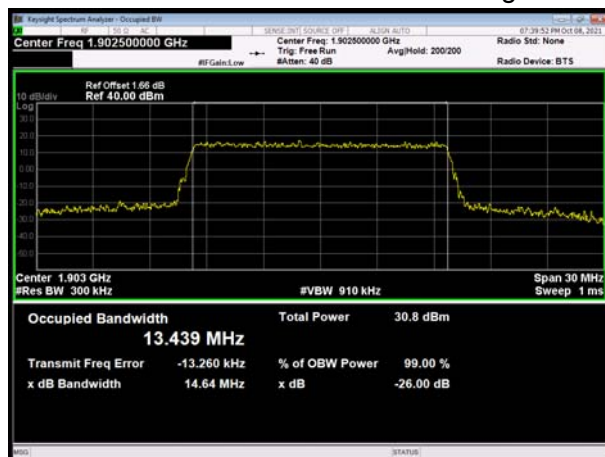
LTE Band 2 15MHz QPSK CH-Middle



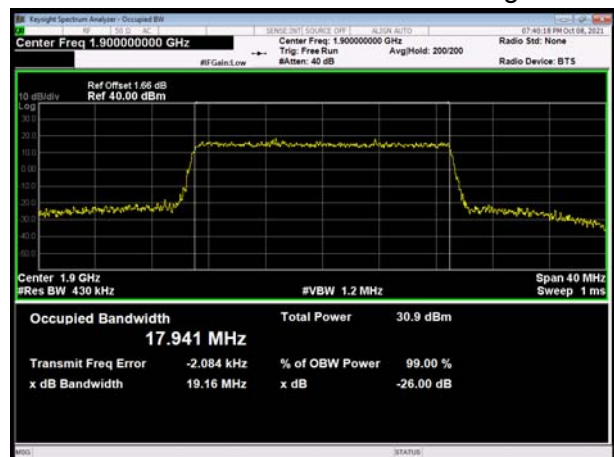
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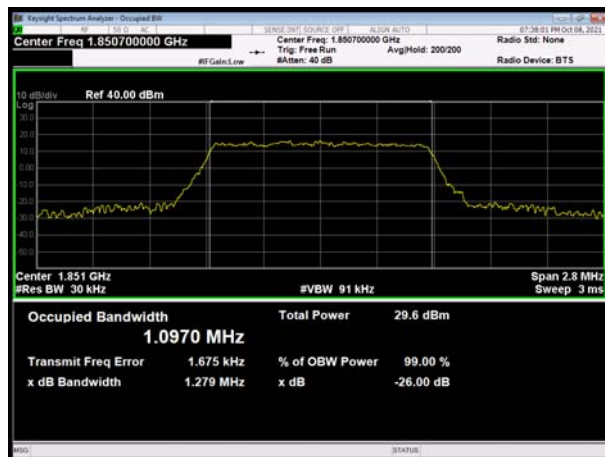
LTE Band 2 15MHz QPSK CH-High



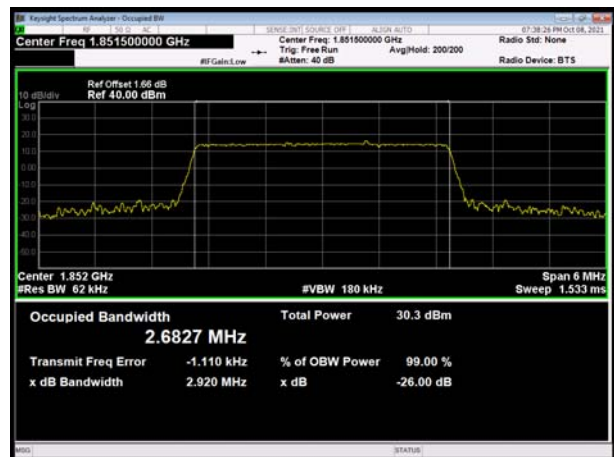
LTE Band 2 20MHz QPSK CH-High



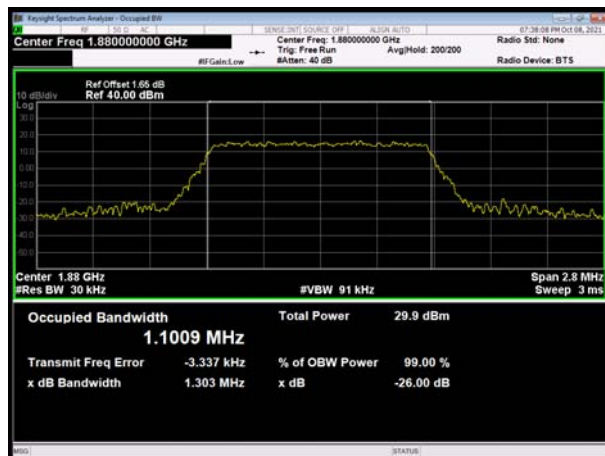
LTE Band 2 1.4MHz 16QAM CH-Low



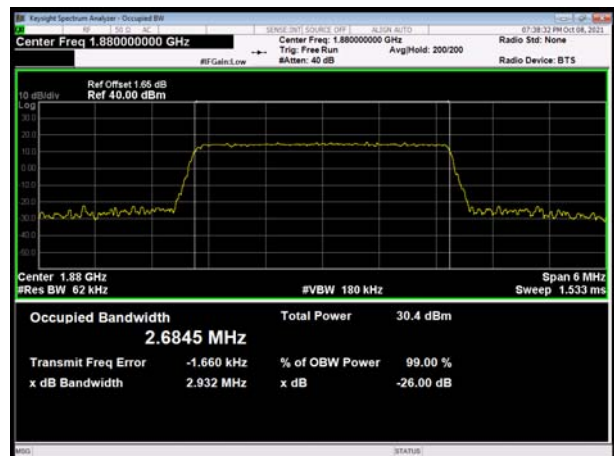
LTE Band 2 3MHz 16QAM CH-Low



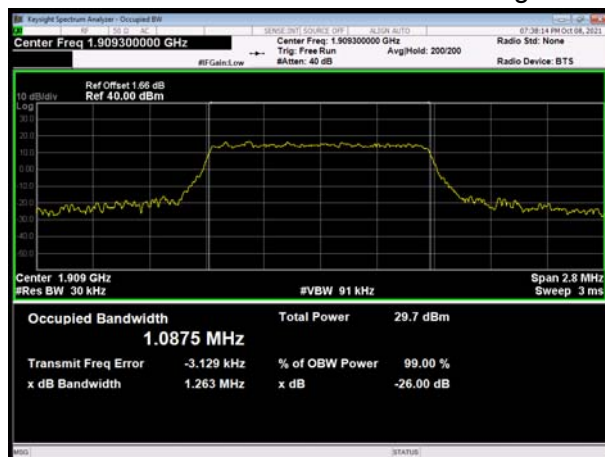
LTE Band 2 1.4MHz 16QAM CH-Middle



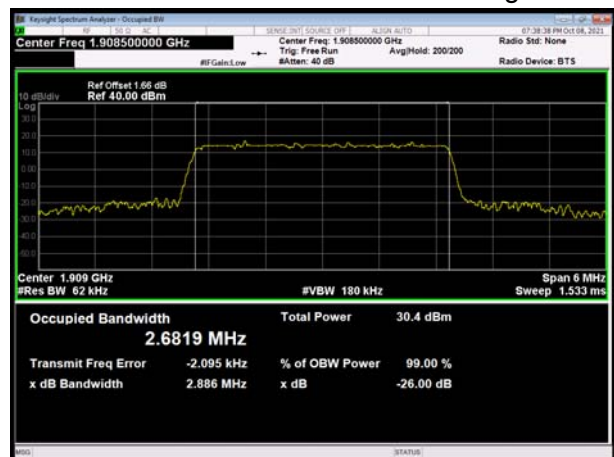
LTE Band 2 3MHz 16QAM CH-Middle



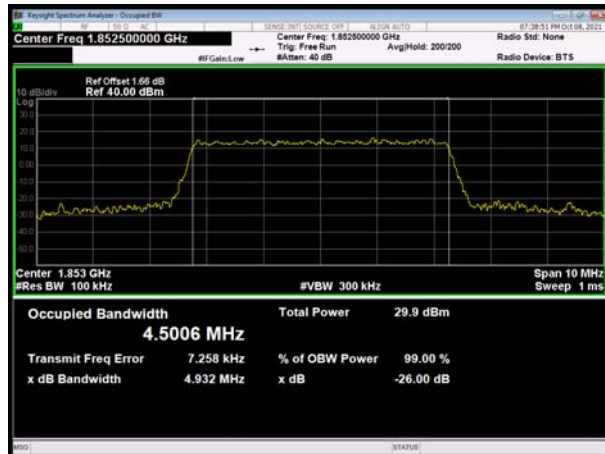
LTE Band 2 1.4MHz 16QAM CH-High



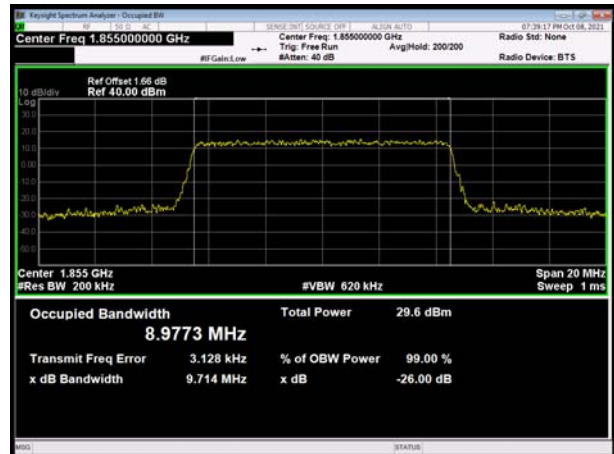
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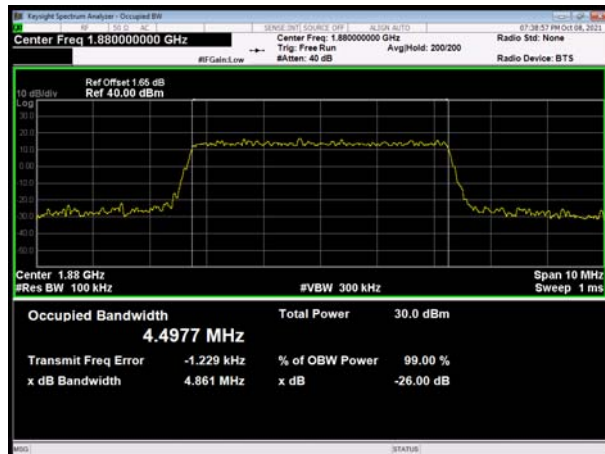
LTE Band 2 5MHz 16QAM CH-Low



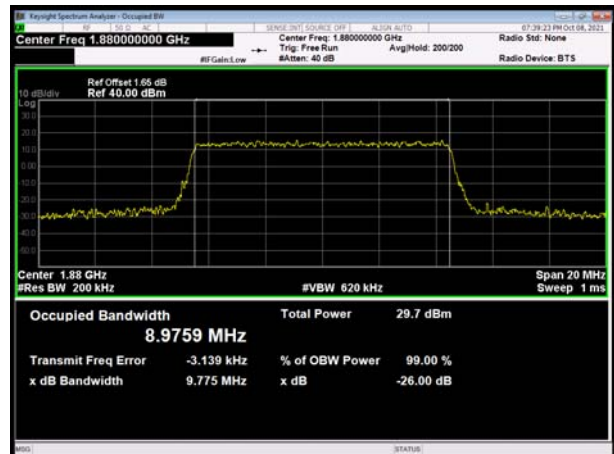
LTE Band 2 10MHz 16QAM CH-Low



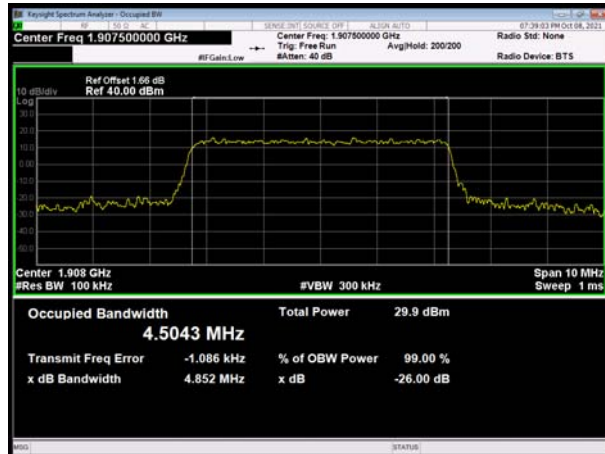
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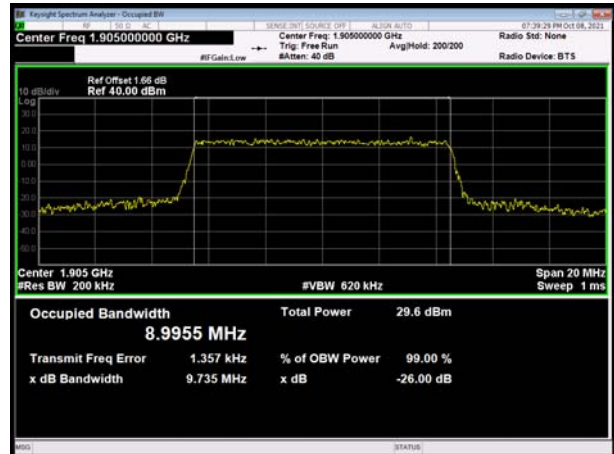
LTE Band 2 10MHz 16QAM CH-Middle



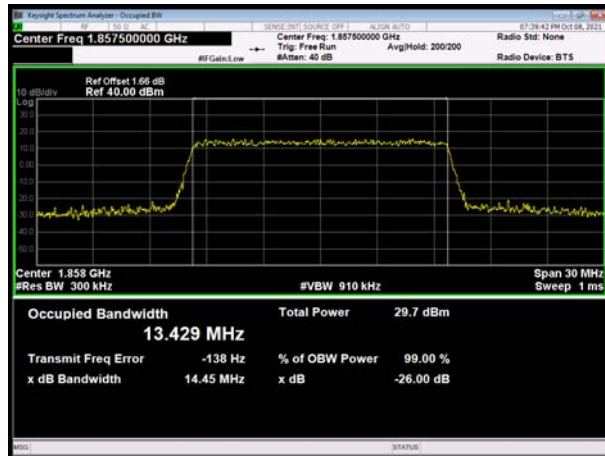
LTE Band 2 5MHz 16QAM CH-High



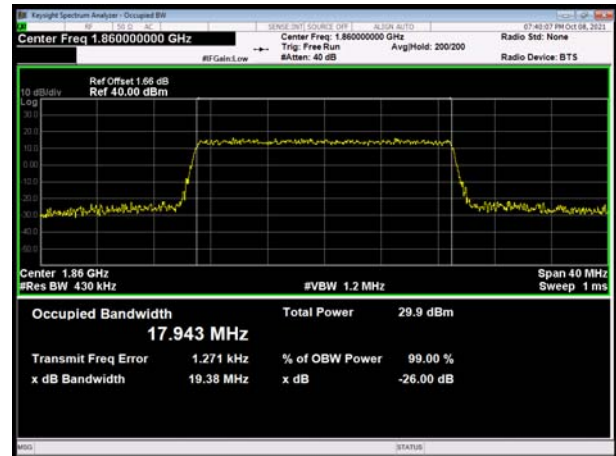
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LTE Band 2 15MHz 16QAM CH-Low



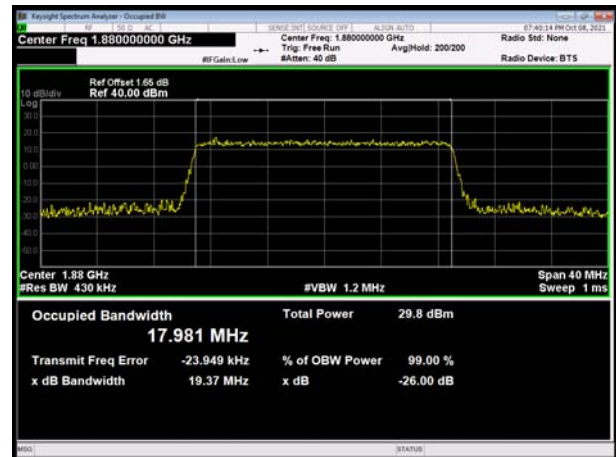
LTE Band 2 20MHz 16QAM CH-Low



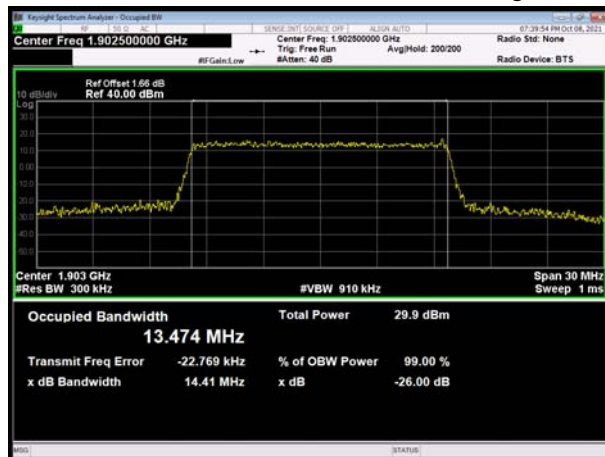
LTE Band 2 15MHz 16QAM CH-Middle



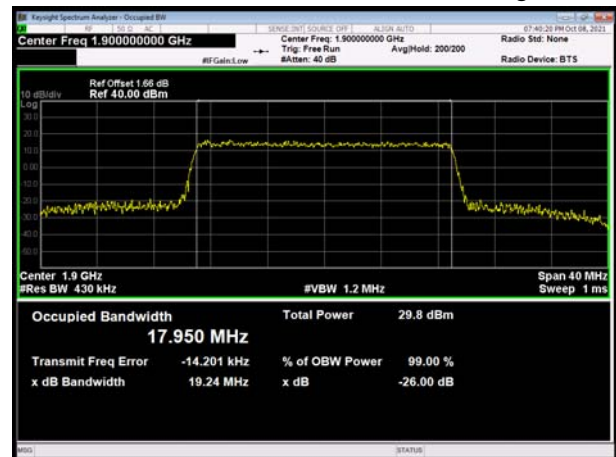
LTE Band 2 20MHz 16QAM CH-Middle



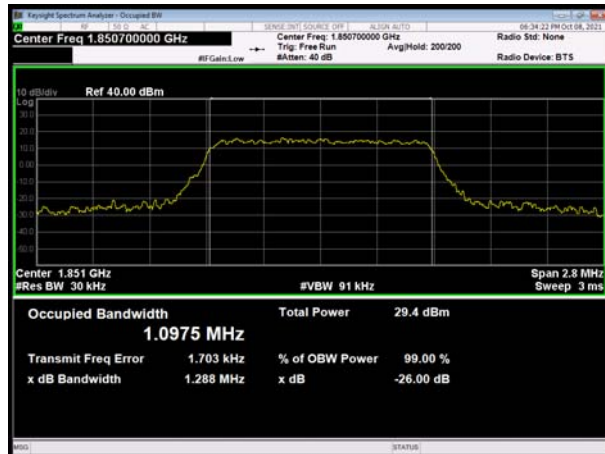
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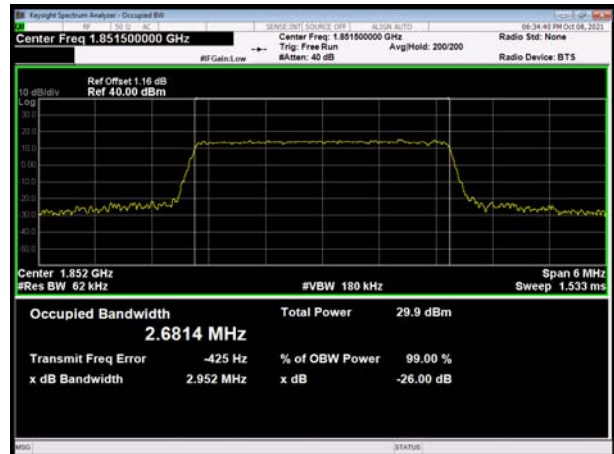
LTE Band 2 20MHz 16QAM CH-High



LTE Band 2 1.4MHz 64QAM CH-Low



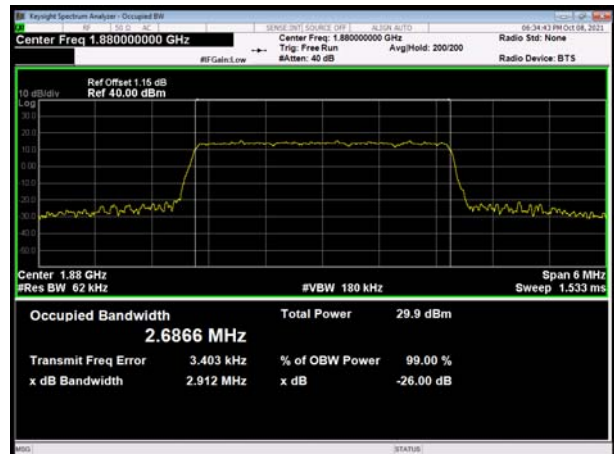
LTE Band 2 3MHz 64QAM CH-Low



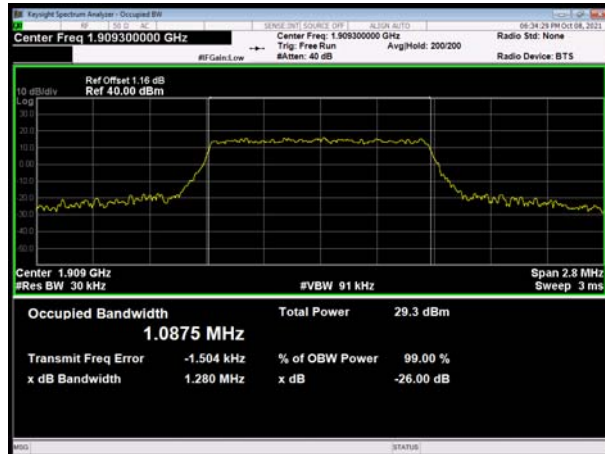
LTE Band 2 1.4MHz 64QAM CH-Middle



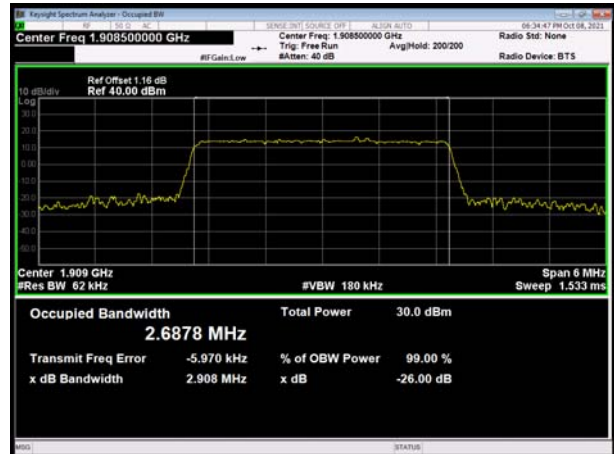
LTE Band 2 3MHz 64QAM CH-Middle



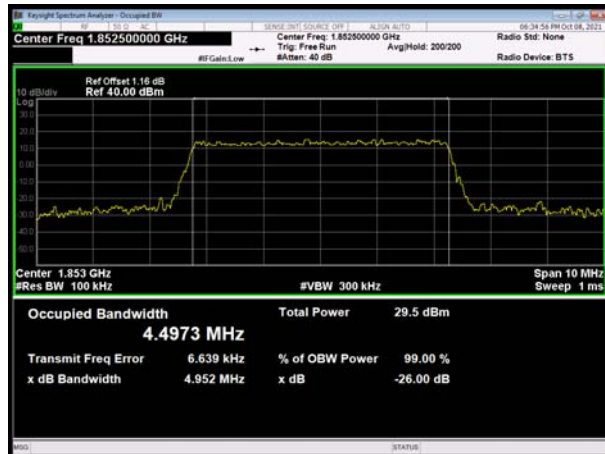
LTE Band 2 1.4MHz 64QAM CH-High



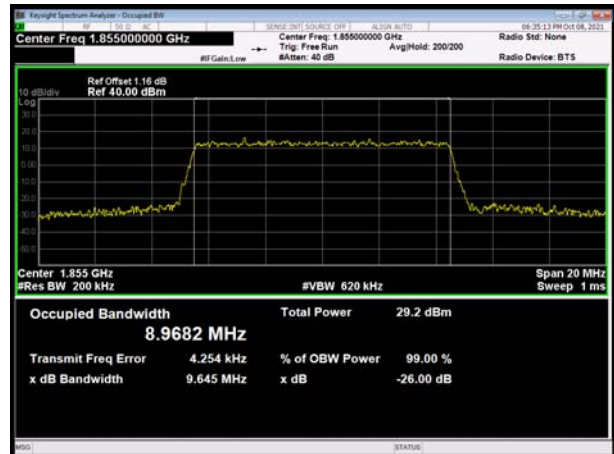
LTE Band 2 3MHz 64QAM CH-High



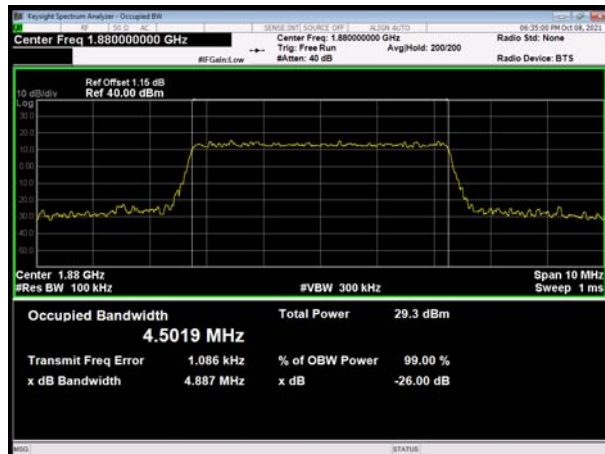
LTE Band 2 5MHz 64QAM CH-Low



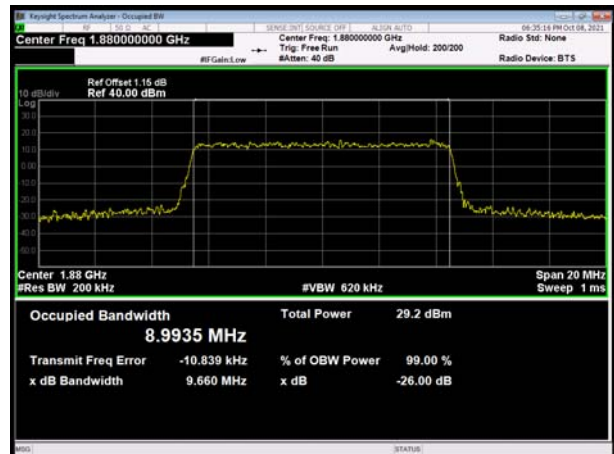
LTE Band 2 10MHz 64QAM CH-Low



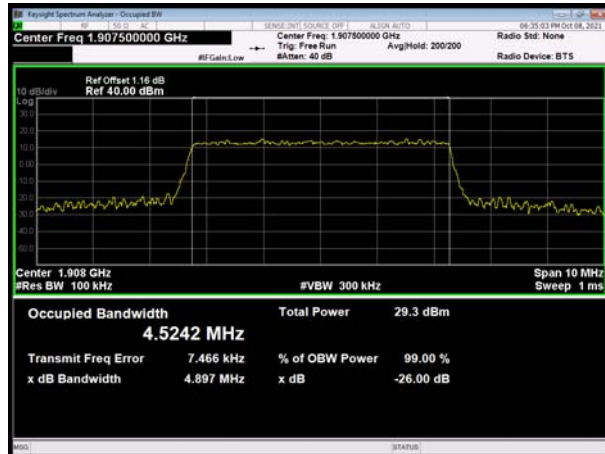
LTE Band 2 5MHz 64QAM CH-Middle



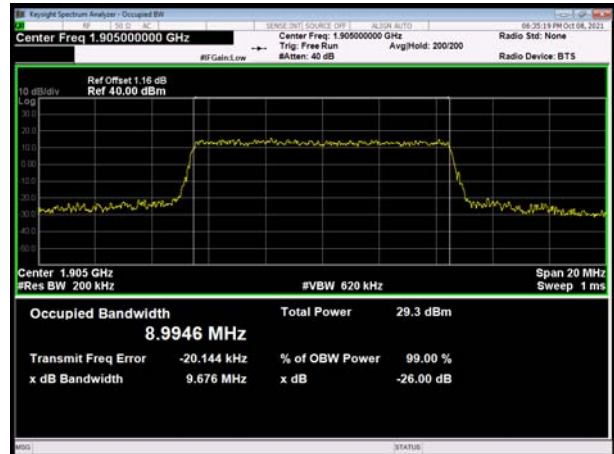
LTE Band 2 10MHz 64QAM CH-Middle



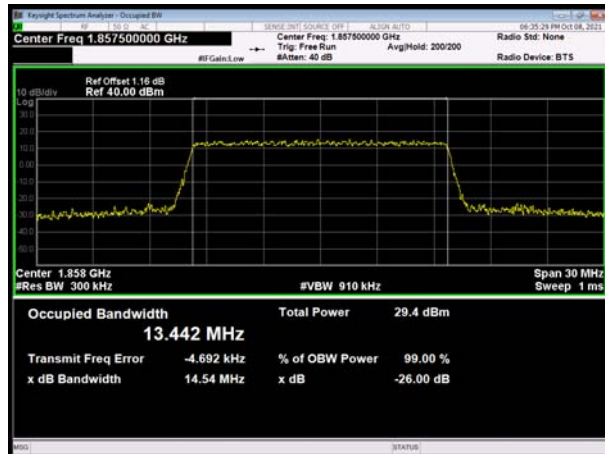
LTE Band 2 5MHz 64QAM CH-High



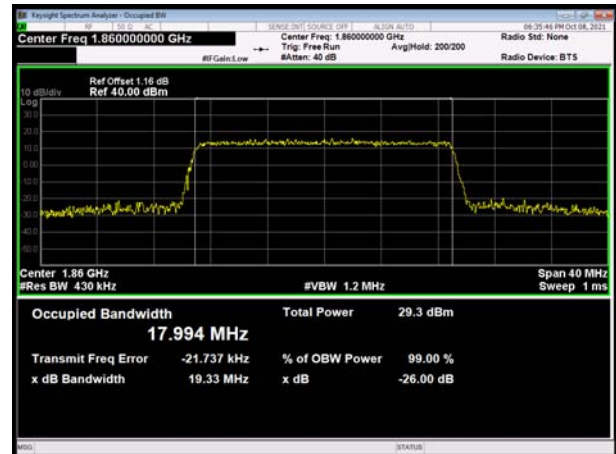
LTE Band 2 10MHz 64QAM CH-High



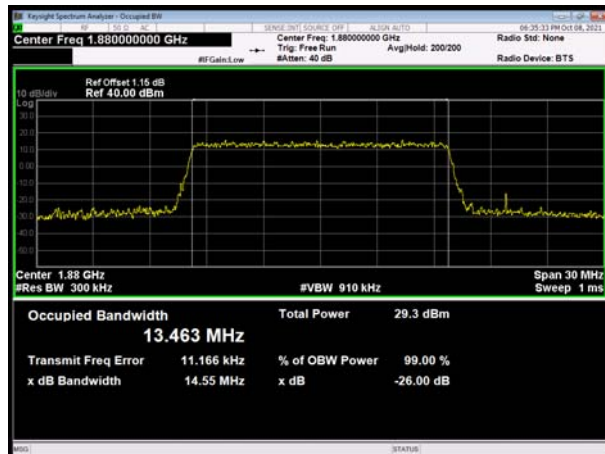
LTE Band 2 15MHz 64QAM CH-Low



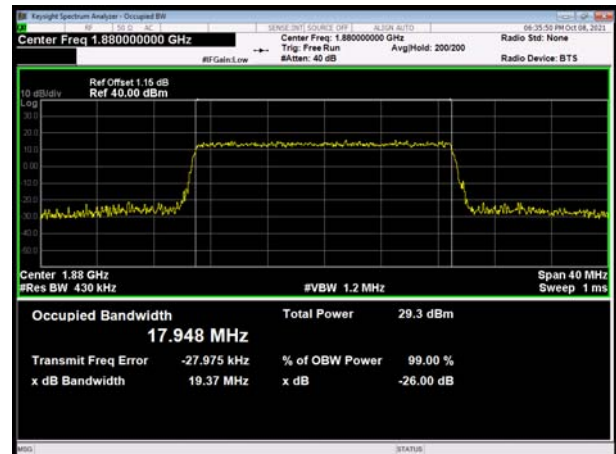
LTE Band 2 20MHz 64QAM CH-Low



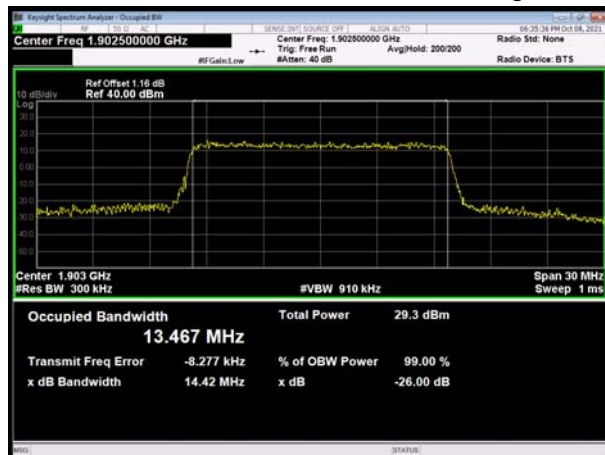
LTE Band 2 15MHz 64QAM CH-Middle



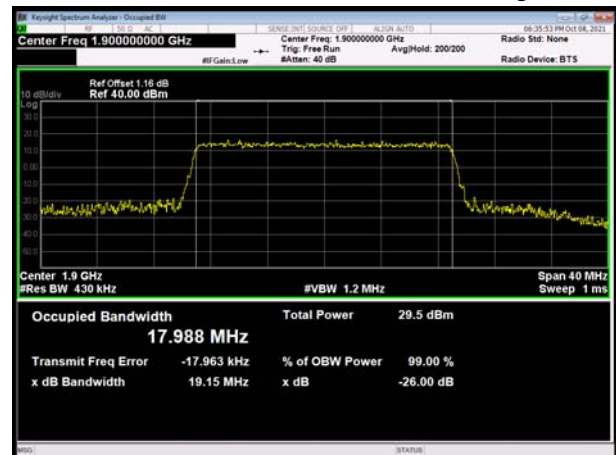
LTE Band 2 20MHz 64QAM CH-Middle



LTE Band 2 15MHz 64QAM CH-High



LTE Band 2 20MHz 64QAM CH-High



5.3.Band Edge Compliance

Ambient condition

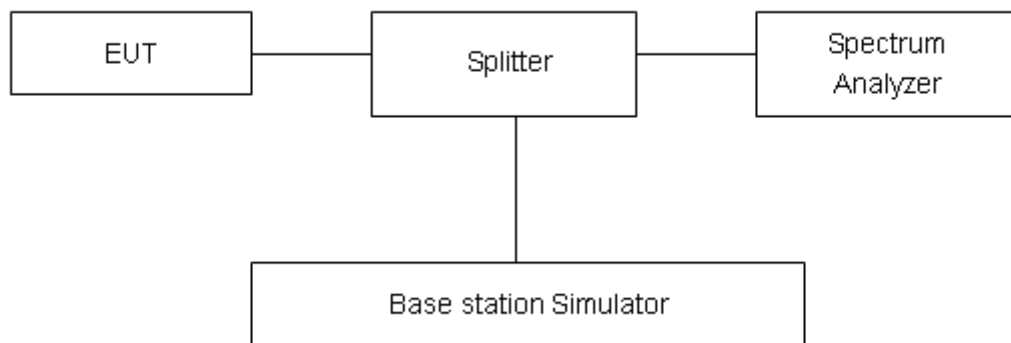
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The Average detector is used and RBW is set to $\geq 1\%EBW$, VBW is set to 3x RBW.

Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

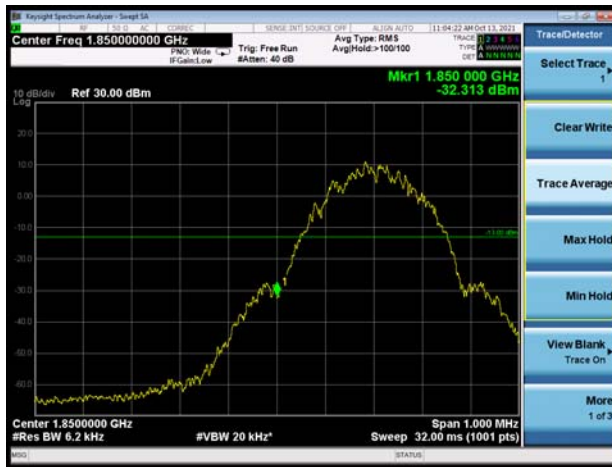
Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U=0.684dB$.

Test Result:

GSM1900 GSM CH-Low



GSM 1900 GSM CH-High



GSM1900 GPRS CH-Low



GSM 1900 GPRS CH-High



GSM1900 EGPRS CH-Low



GSM 1900 EGPRS CH-High





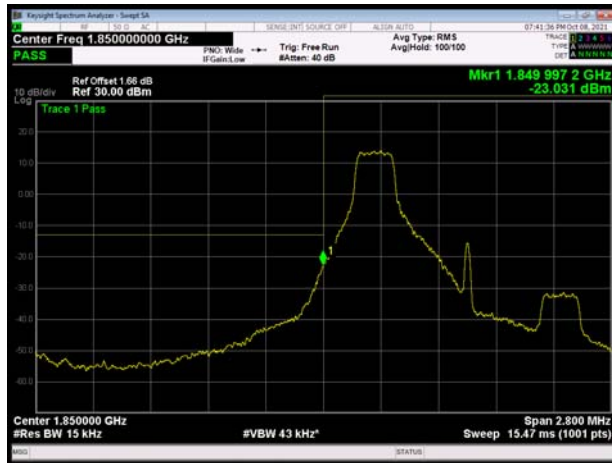
WCDMA Band II RMC CH-Low



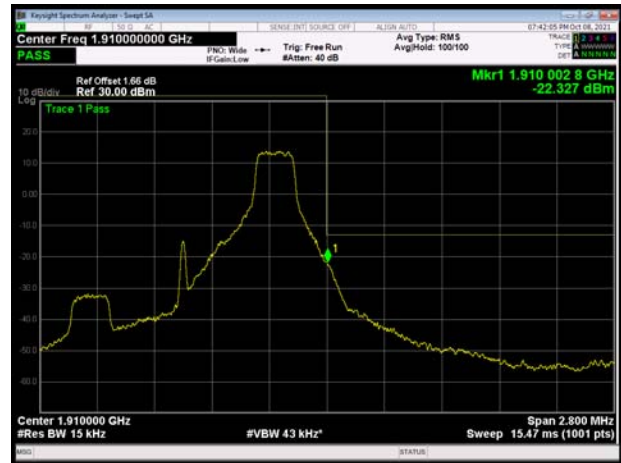
WCDMA Band II RMC CH-High



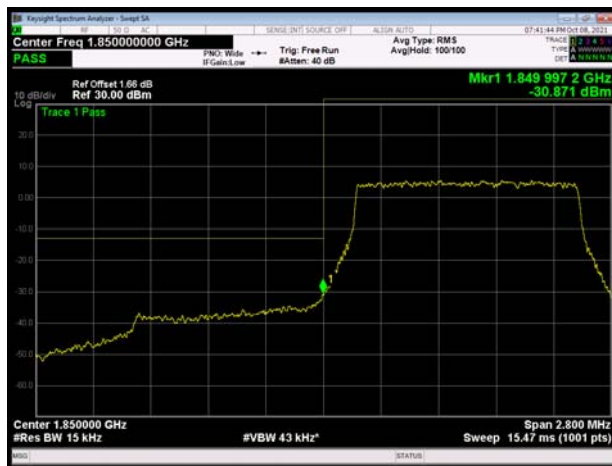
LTE Band 2 1.4MHz QPSK 1RB CH-Low



LTE Band 2 1.4MHz QPSK 1RB CH-High



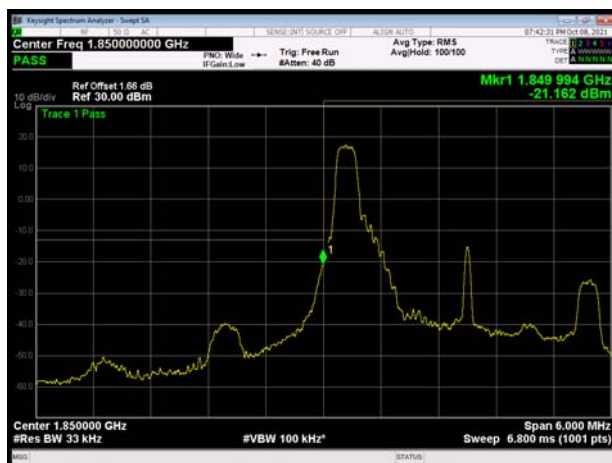
LTE Band 2 1.4MHz QPSK 100%RB CH-Low



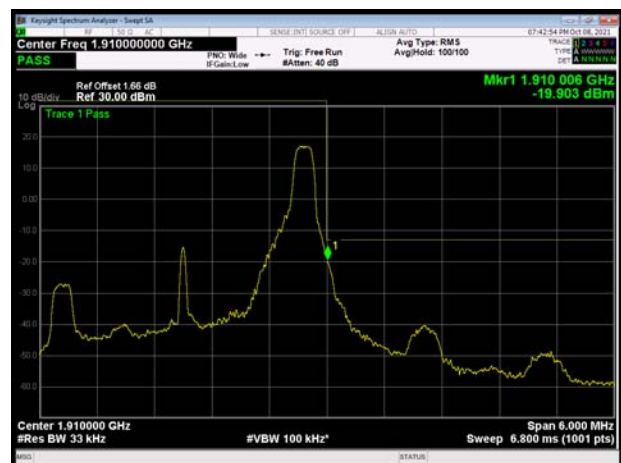
LTE Band 2 1.4MHz QPSK 100%RB CH-High



LTE Band 2 3MHz QPSK 1RB CH-Low

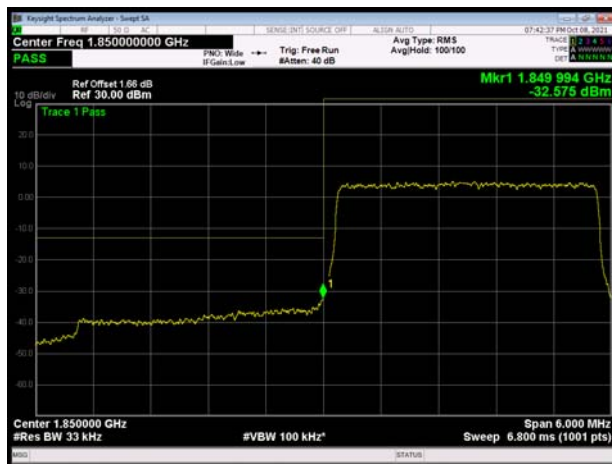


LTE Band 2 3MHz QPSK 1RB CH-High

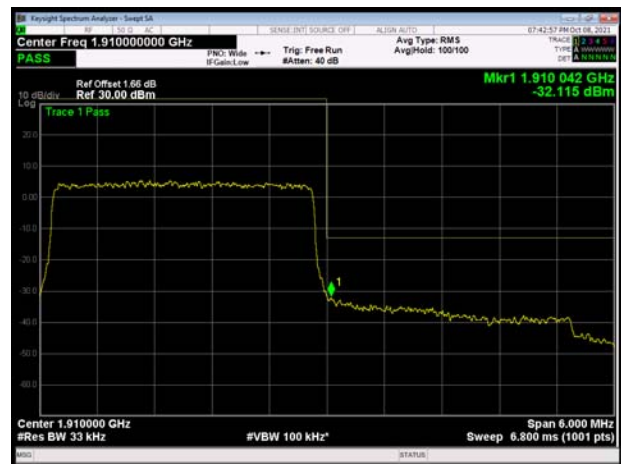




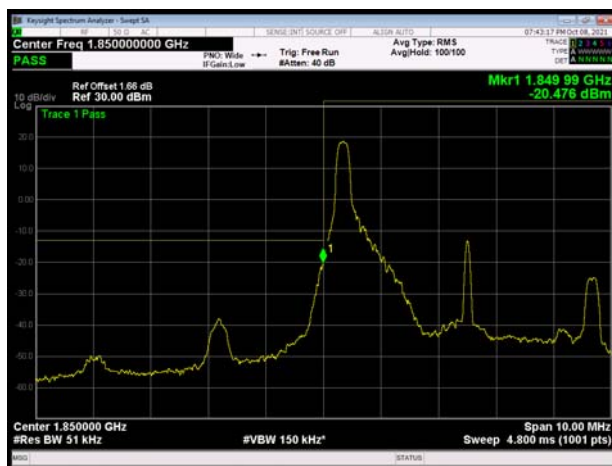
LTE Band 2 3MHz QPSK 100%RB CH-Low



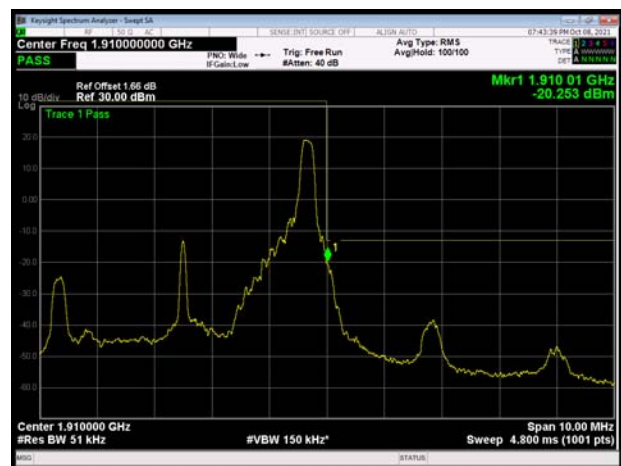
LTE Band 2 3MHz QPSK 100%RB CH-High



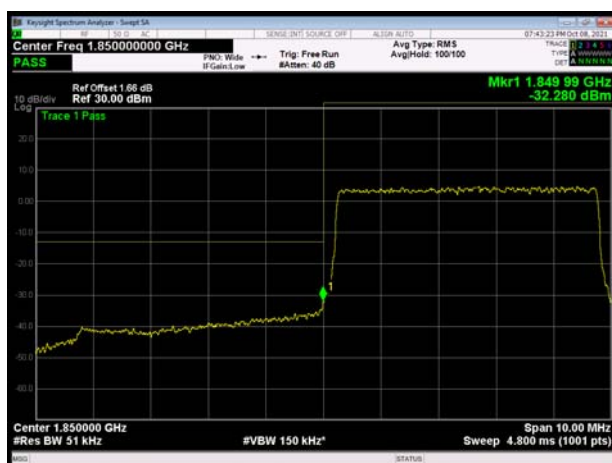
LTE Band 2 5MHz QPSK 1RB CH-Low



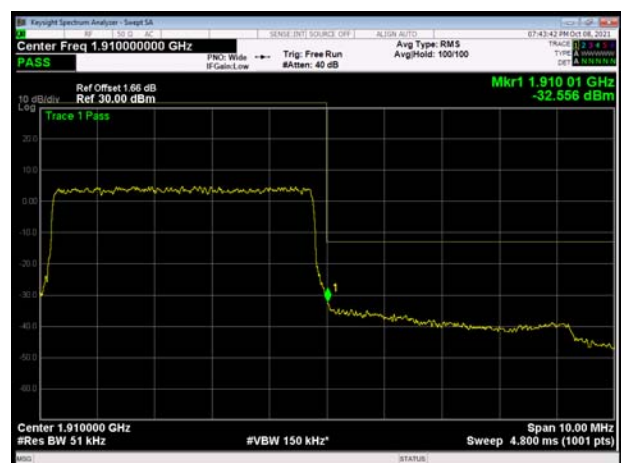
LTE Band 2 5MHz QPSK 1RB CH-High



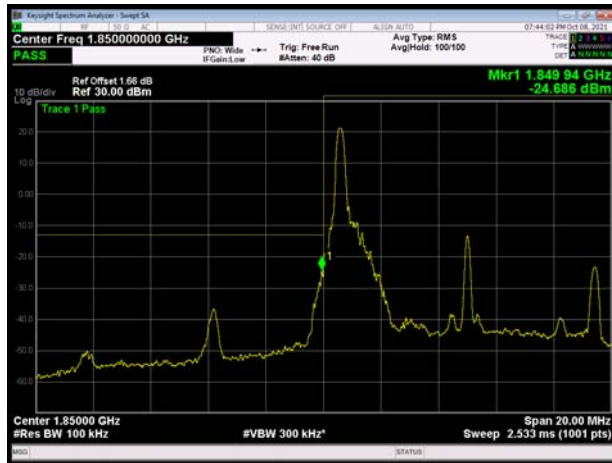
LTE Band 2 5MHz QPSK 100%RB CH-Low



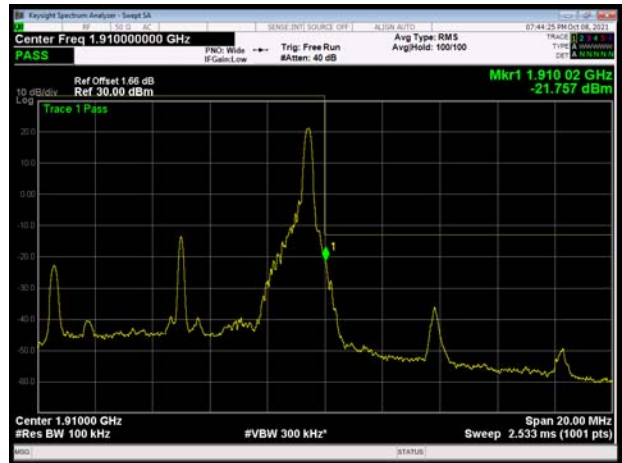
LTE Band 2 5MHz QPSK 100%RB CH-High



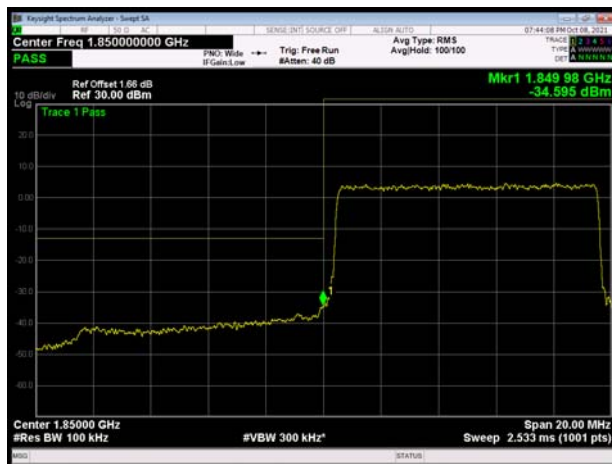
LTE Band 2 10MHz QPSK 1RB CH-Low



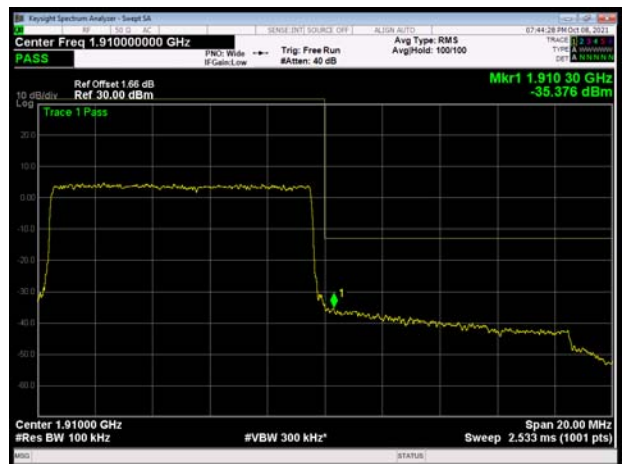
LTE Band 2 10MHz QPSK 1RB CH-High



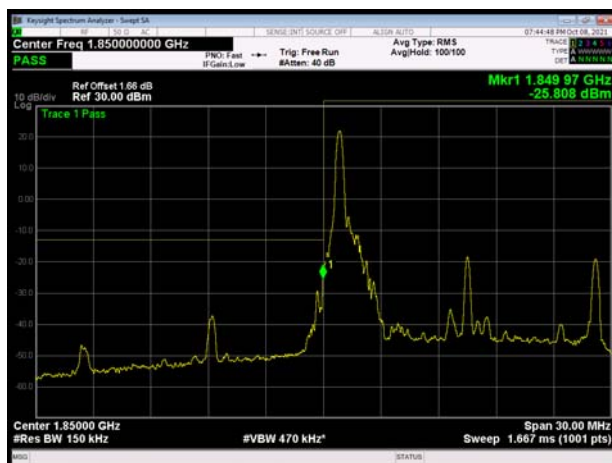
LTE Band 2 10MHz QPSK 100%RB CH-Low



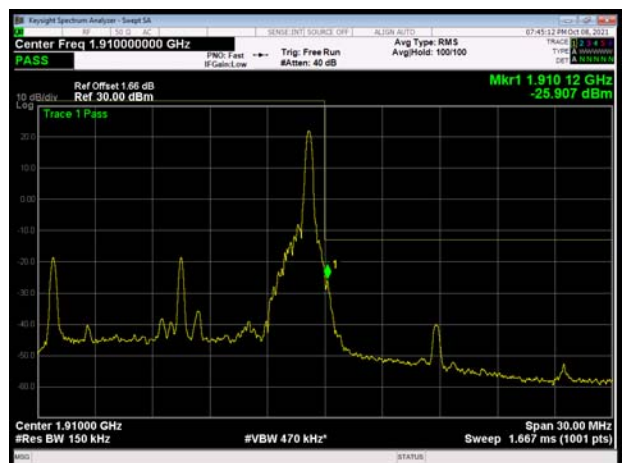
LTE Band 2 10MHz QPSK 100%RB CH-High



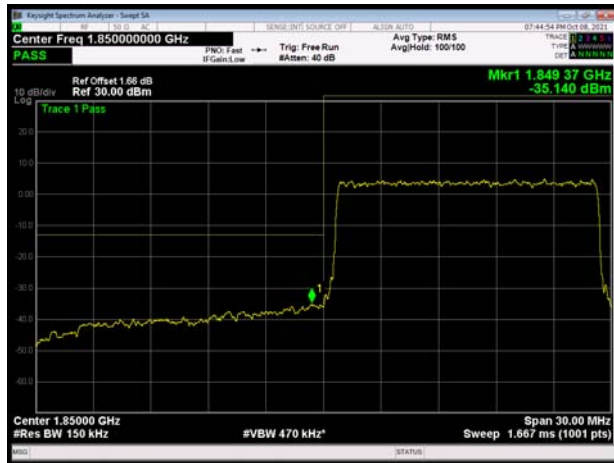
LTE Band 2 15MHz QPSK 1RB CH-Low



LTE Band 2 15MHz QPSK 1RB CH-High



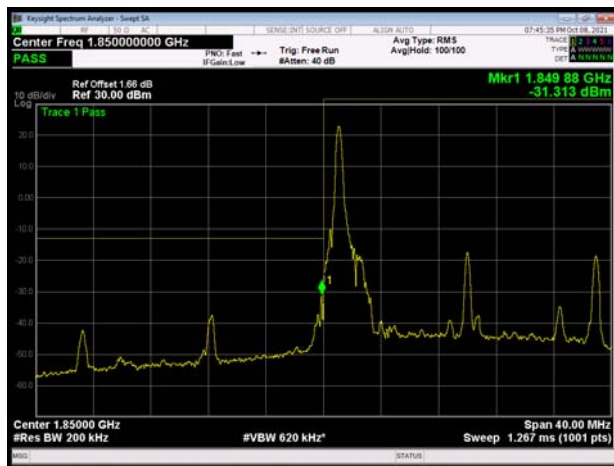
LTE Band 2 15MHz QPSK 100%RB CH-Low



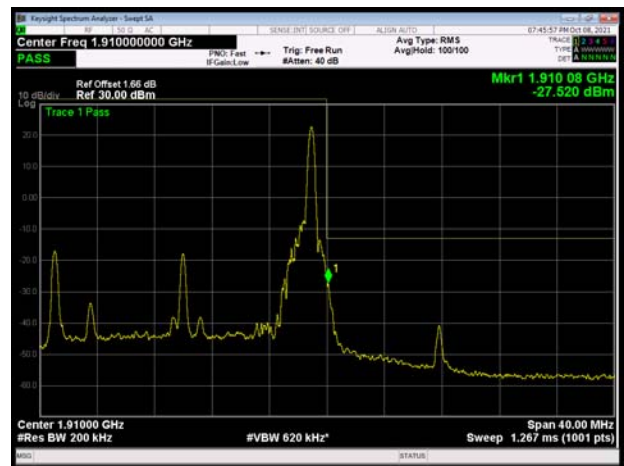
LTE Band 2 15MHz QPSK 100%RB CH-High



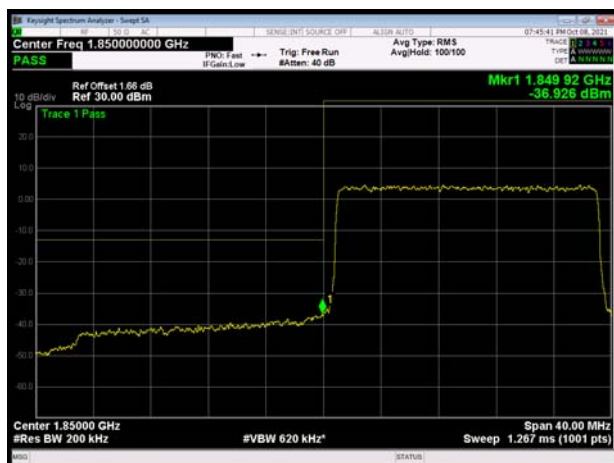
LTE Band 2 20MHz QPSK 1RB CH-Low



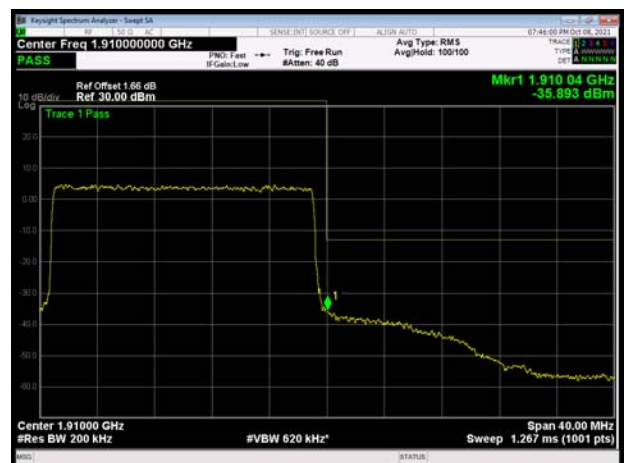
LTE Band 2 20MHz QPSK 1RB CH-High



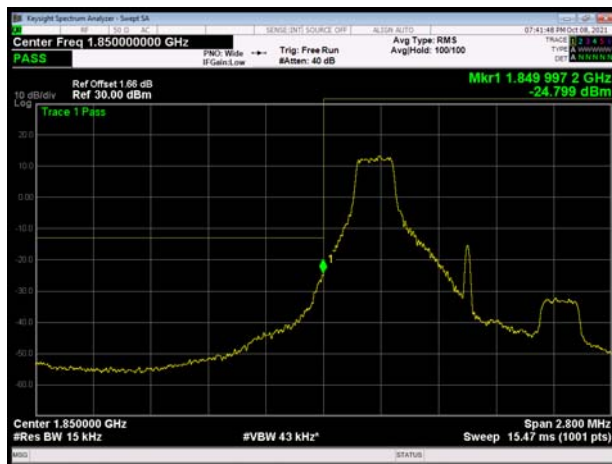
LTE Band 2 20MHz QPSK 100%RB CH-Low



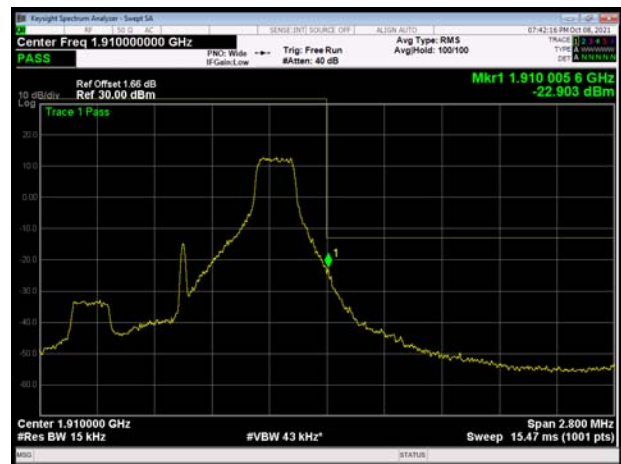
LTE Band 2 20MHz QPSK 100%RB CH-High



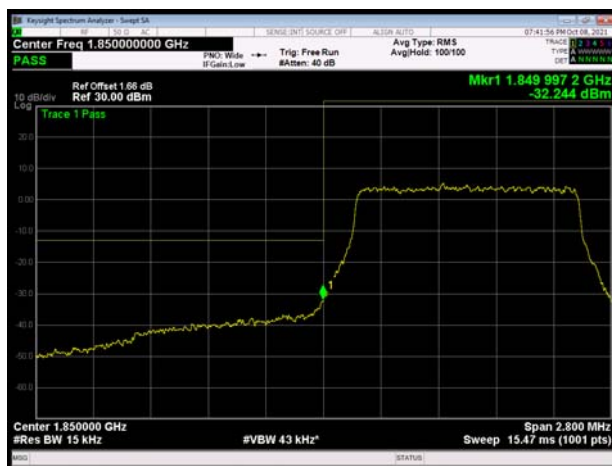
LTE Band 2 1.4MHz 16QAM 1RB CH-Low



LTE Band 2 1.4MHz 16QAM 1RB CH-High



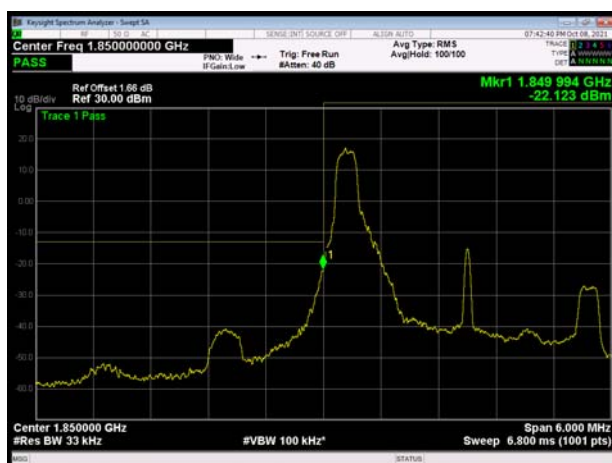
LTE Band 2 1.4MHz 16QAM 100%RB CH-Low



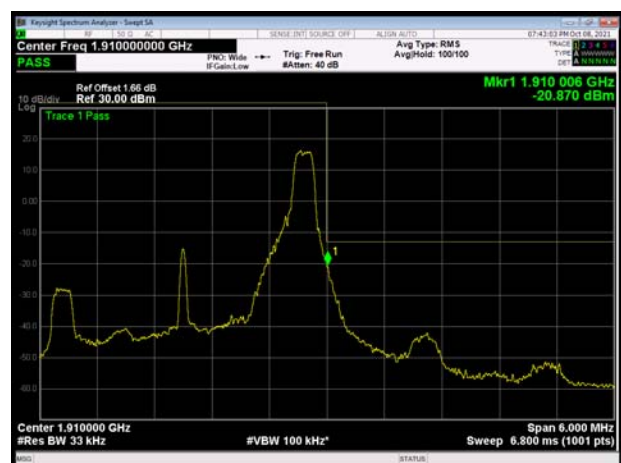
LTE Band 2 1.4MHz 16QAM 100%RB CH-High



LTE Band 2 3MHz 16QAM 1RB CH-Low

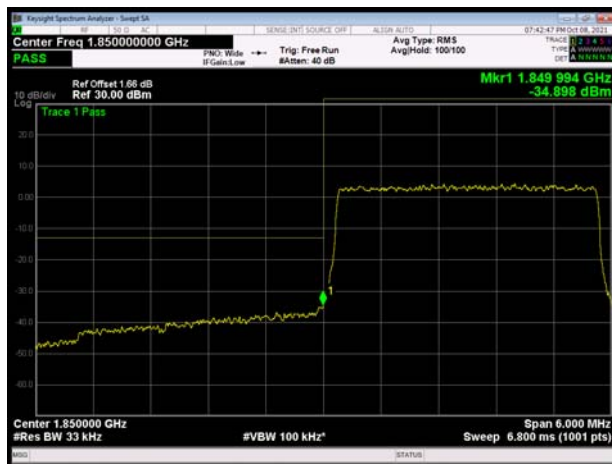


LTE Band 2 3MHz 16QAM 1RB CH-High

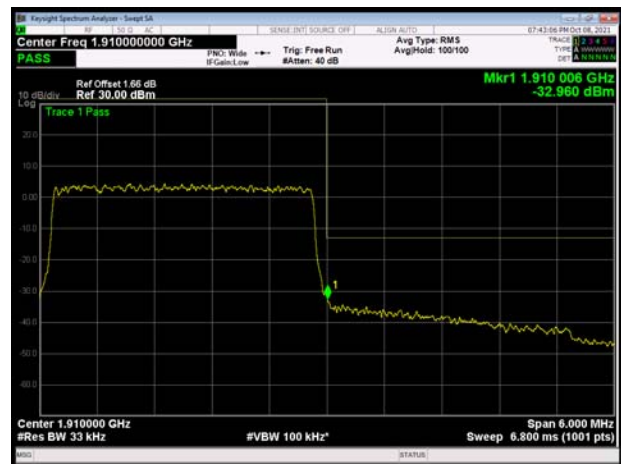




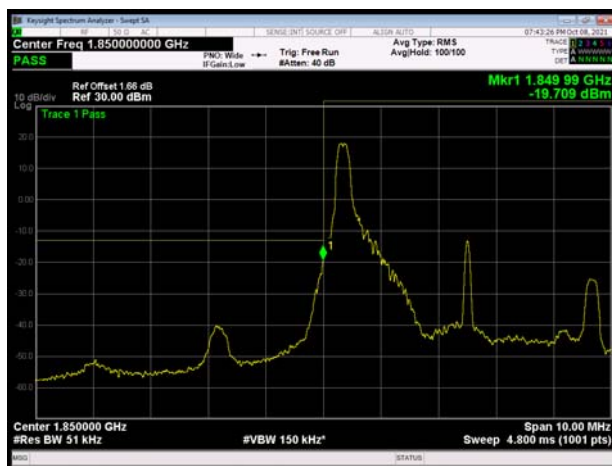
LTE Band 2 3MHz 16QAM 100%RB CH-Low



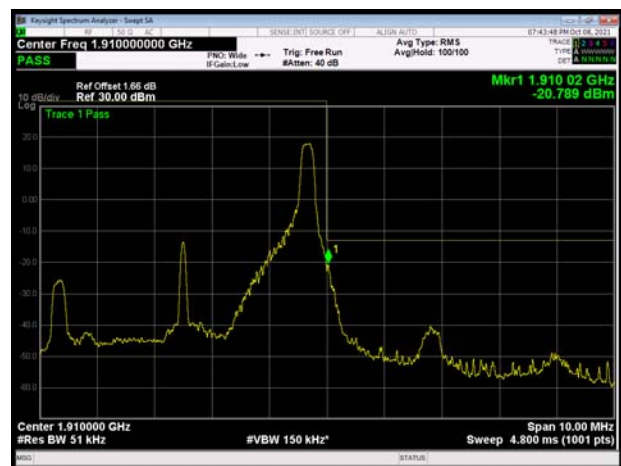
LTE Band 2 3MHz 16QAM 100%RB CH-High



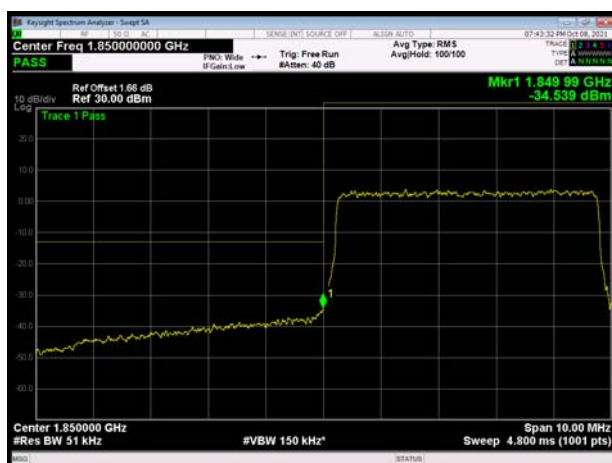
LTE Band 2 5MHz 16QAM 1RB CH-Low



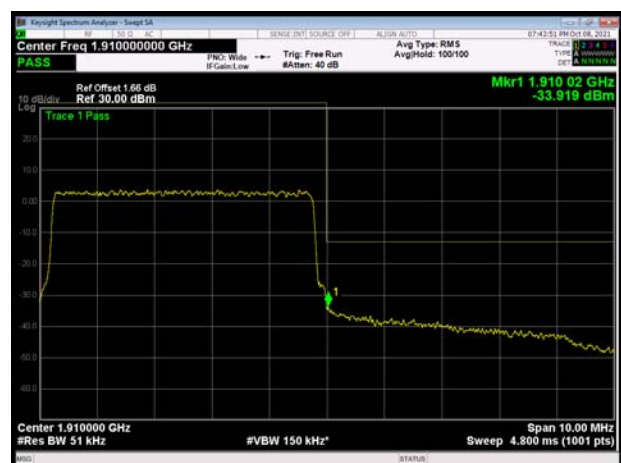
LTE Band 2 5MHz 16QAM 1RB CH-High



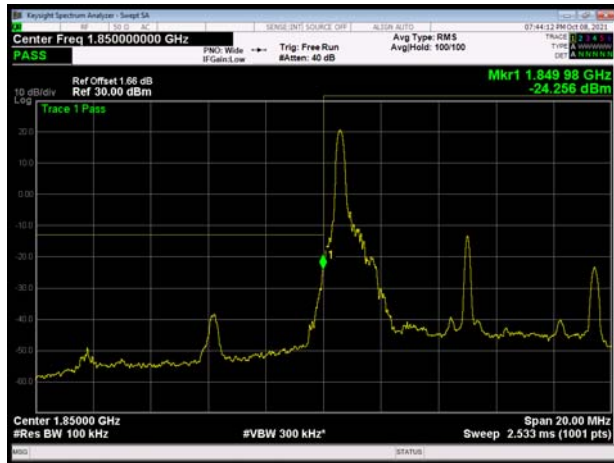
LTE Band 2 5MHz 16QAM 100%RB CH-Low



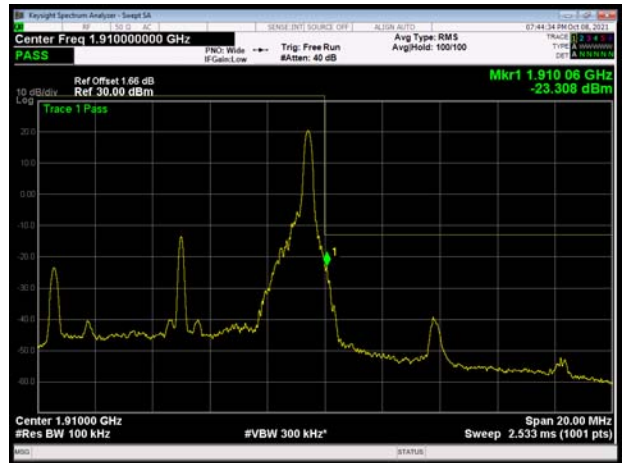
LTE Band 2 5MHz 16QAM 100%RB CH-High



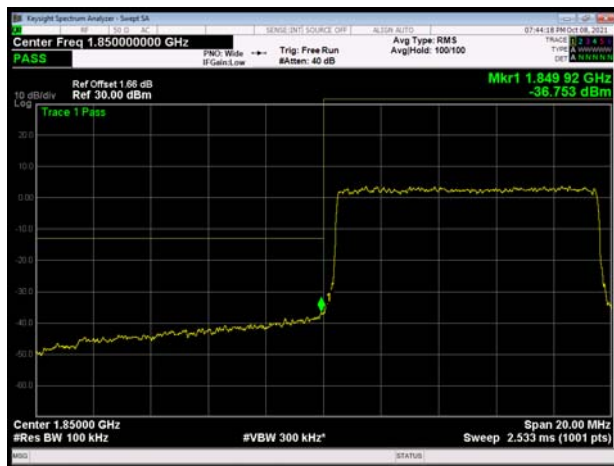
LTE Band 2 10MHz 16QAM 1RB CH-Low



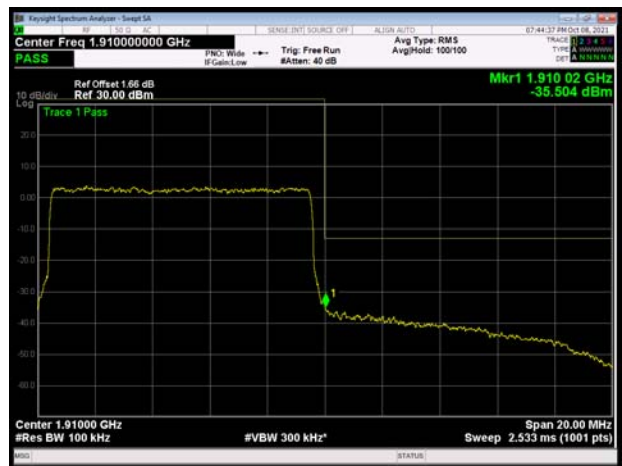
LTE Band 2 10MHz 16QAM 1RB CH-High



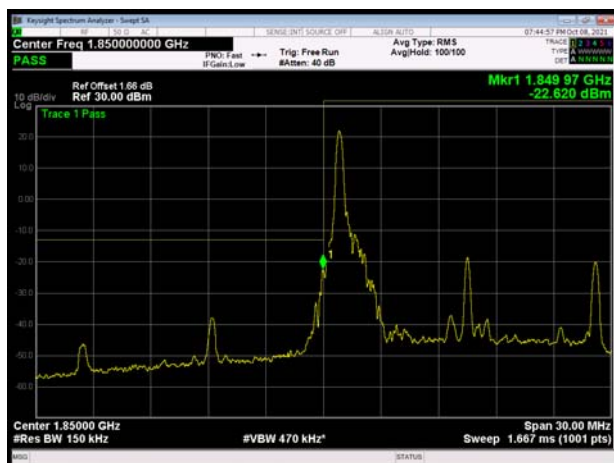
LTE Band 2 10MHz 16QAM 100%RB CH-Low



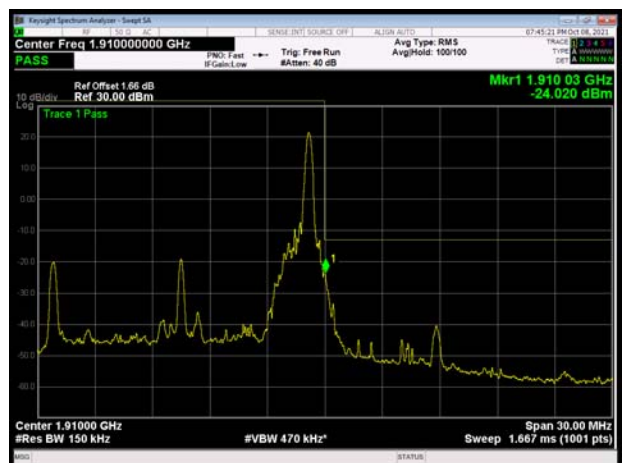
LTE Band 2 10MHz 16QAM 100%RB CH-High



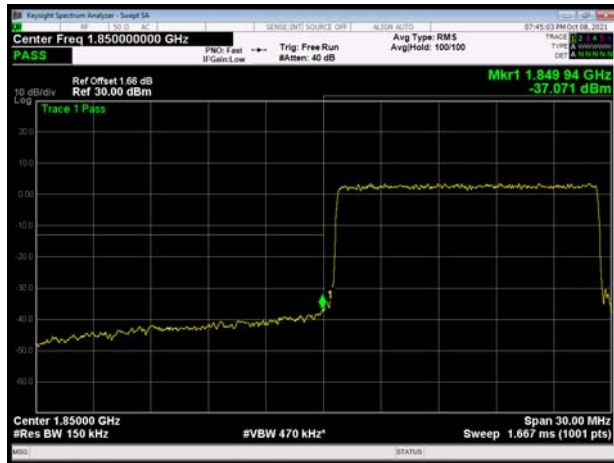
LTE Band 2 15MHz 16QAM 1RB CH-Low



LTE Band 2 15MHz 16QAM 1RB CH-High



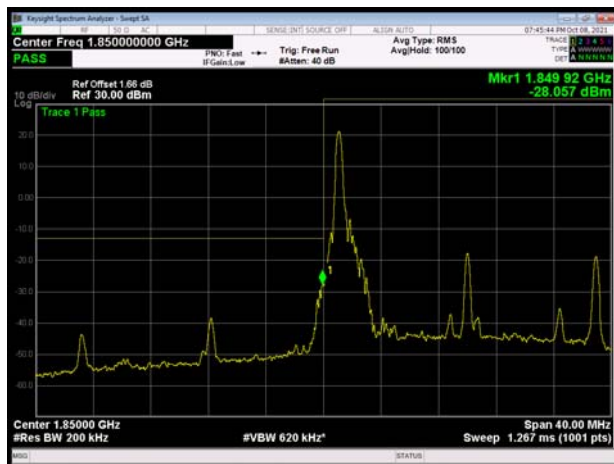
LTE Band 2 15MHz 16QAM 100%RB CH-Low



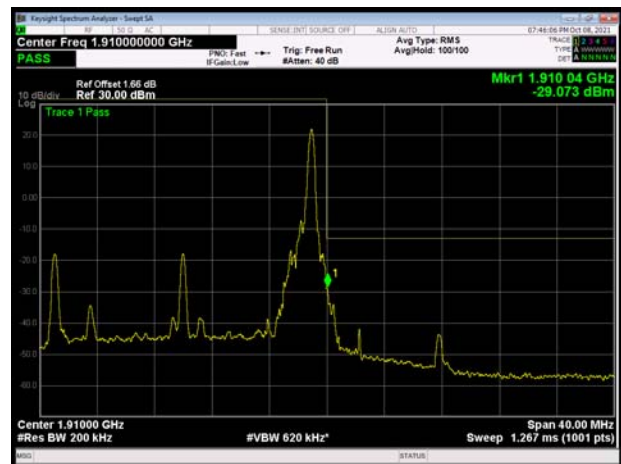
LTE Band 2 15MHz 16QAM 100%RB CH-High



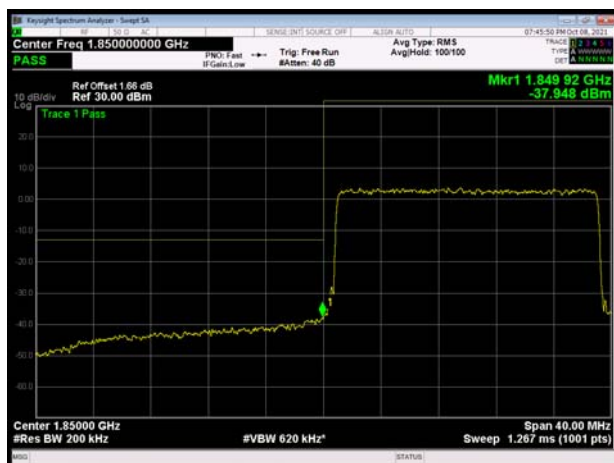
LTE Band 2 20MHz 16QAM 1RB CH-Low



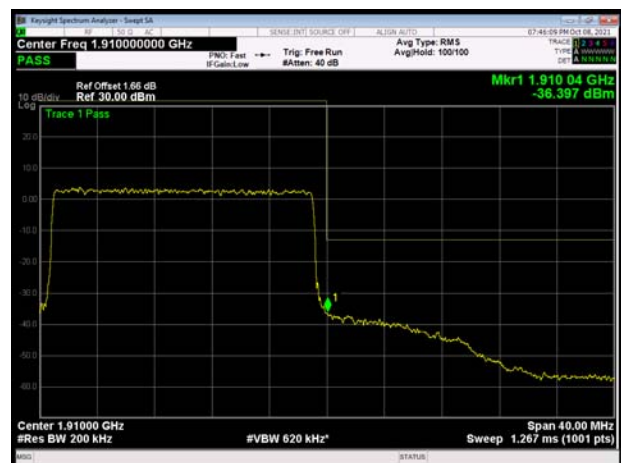
LTE Band 2 20MHz 16QAM 1RB CH-High



LTE Band 2 20MHz 16QAM 100%RB CH-Low

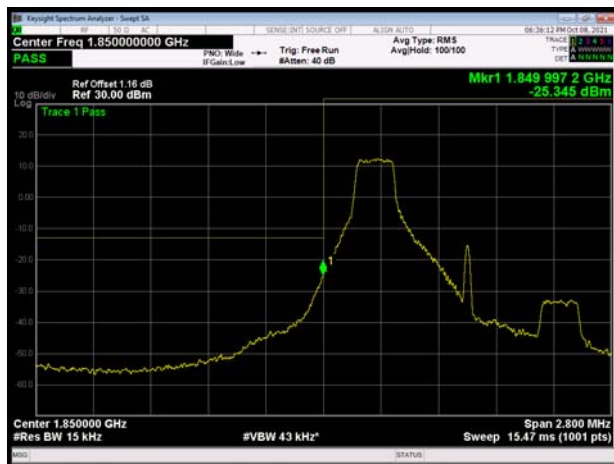


LTE Band 2 20MHz 16QAM 100%RB CH-High





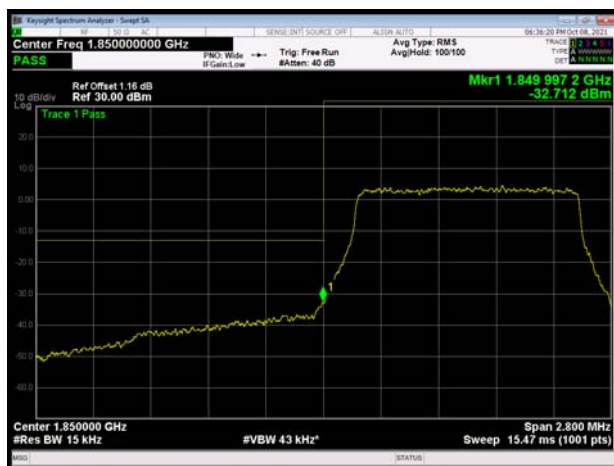
LTE Band 2 1.4MHz 64QAM 1RB CH-Low



LTE Band 2 1.4MHz 64QAM 1RB CH-High



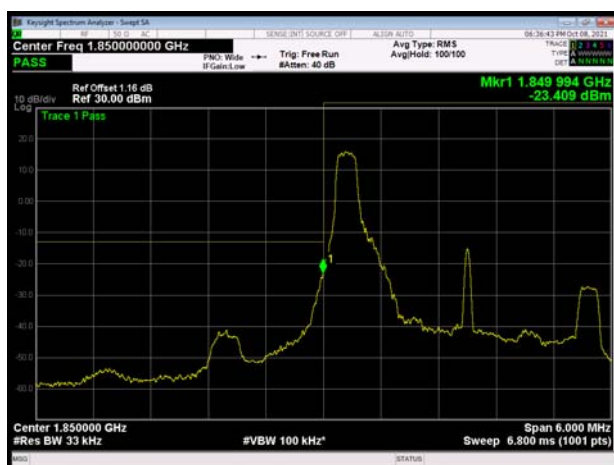
LTE Band 2 1.4MHz 64QAM 100%RB CH-Low



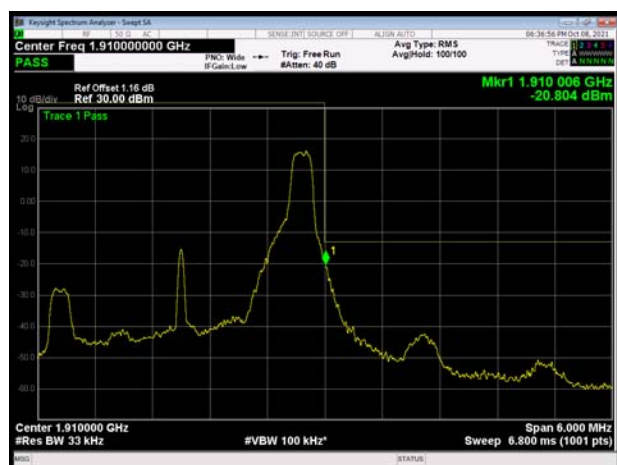
LTE Band 2 1.4MHz 64QAM 100%RB CH-High



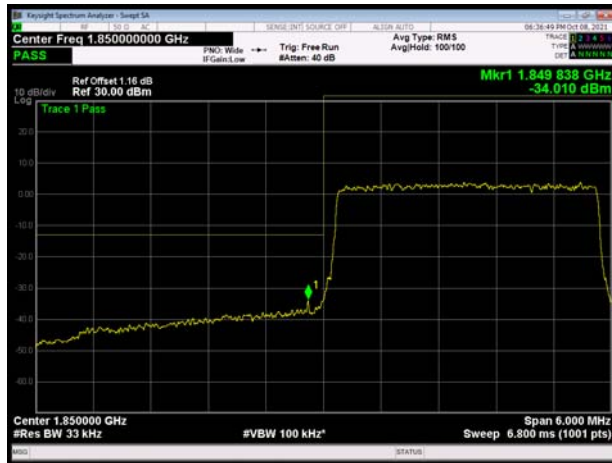
LTE Band 2 3MHz 64QAM 1RB CH-Low



LTE Band 2 3MHz 64QAM 1RB CH-High



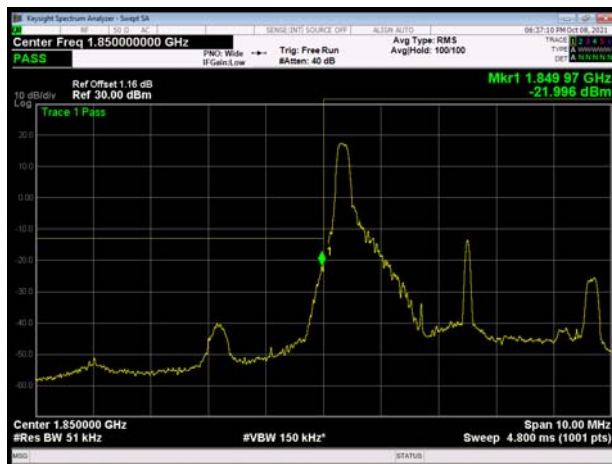
LTE Band 2 3MHz 64QAM 100%RB CH-Low



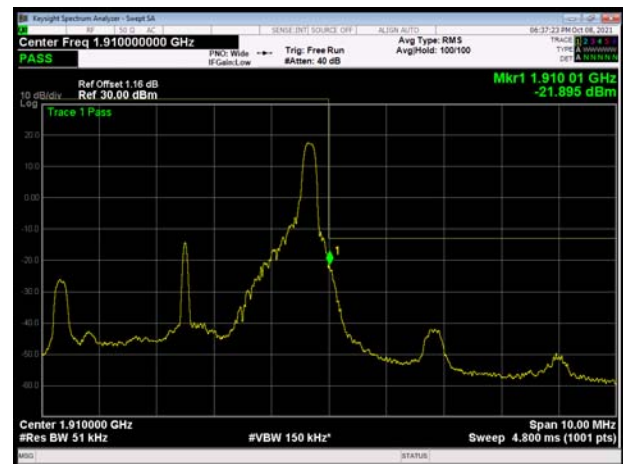
LTE Band 2 3MHz 64QAM 100%RB CH-High



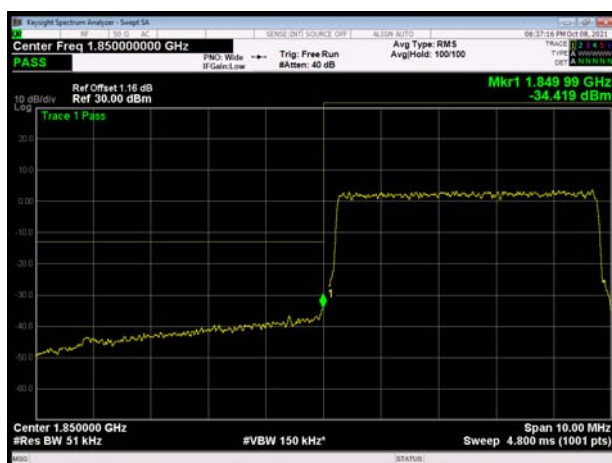
LTE Band 2 5MHz 64QAM 1RB CH-Low



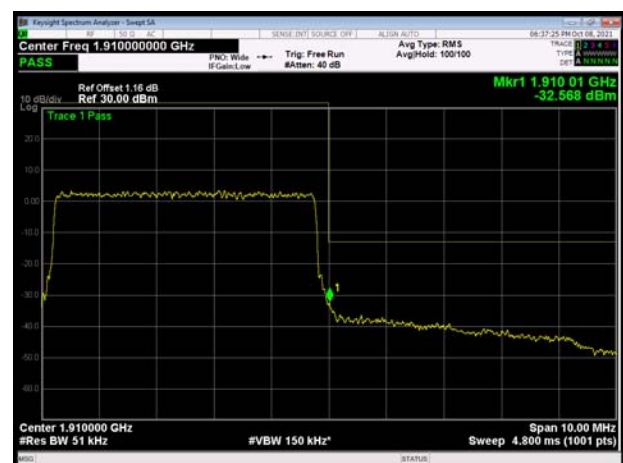
LTE Band 2 5MHz 64QAM 1RB CH-High



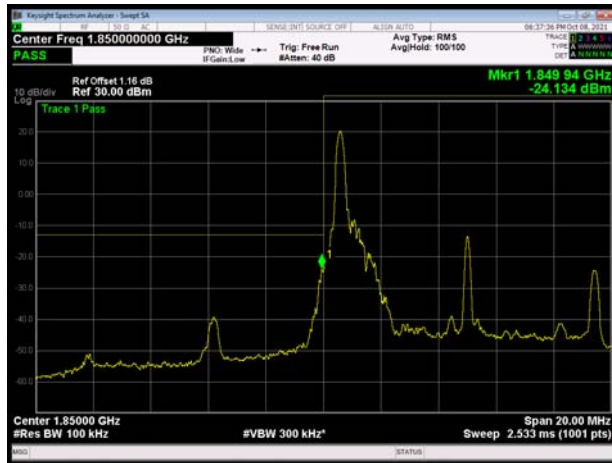
LTE Band 2 5MHz 64QAM 100%RB CH-Low



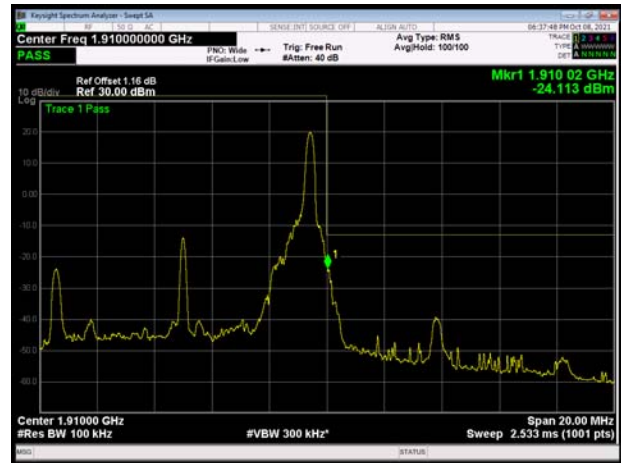
LTE Band 2 5MHz 64QAM 100%RB CH-High



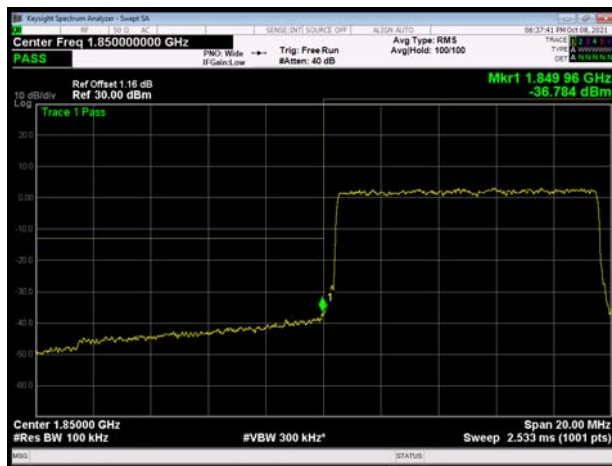
LTE Band 2 10MHz 64QAM 1RB CH-Low



LTE Band 2 10MHz 64QAM 1RB CH-High



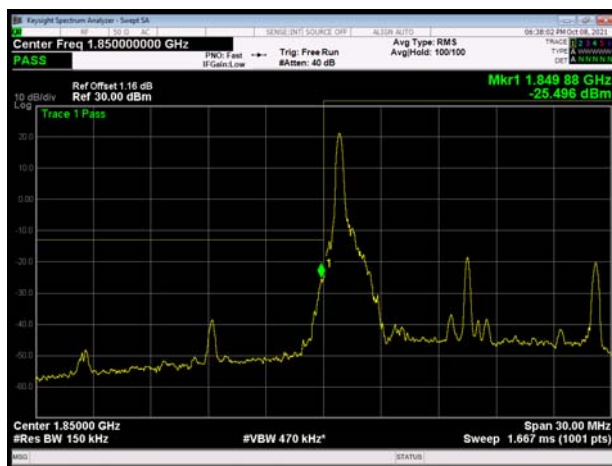
LTE Band 2 10MHz 64QAM 100%RB CH-Low



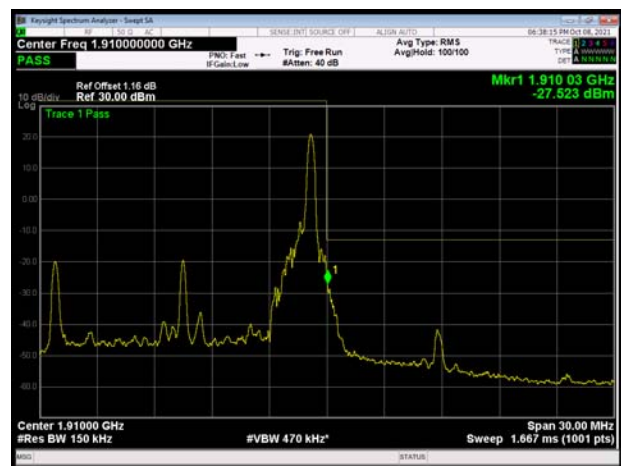
LTE Band 2 10MHz 64QAM 100%RB CH-High



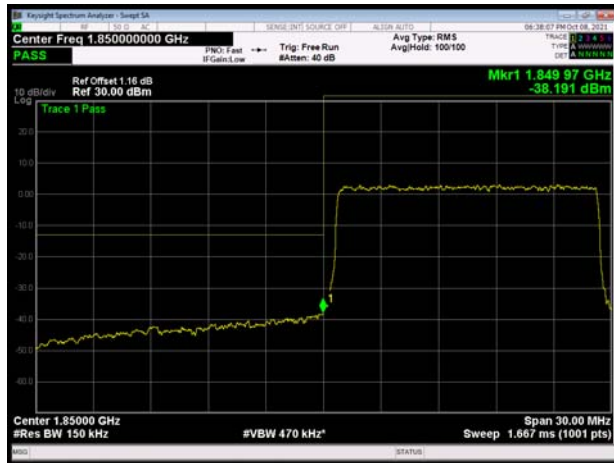
LTE Band 2 15MHz 64QAM 1RB CH-Low



LTE Band 2 15MHz 64QAM 1RB CH-High



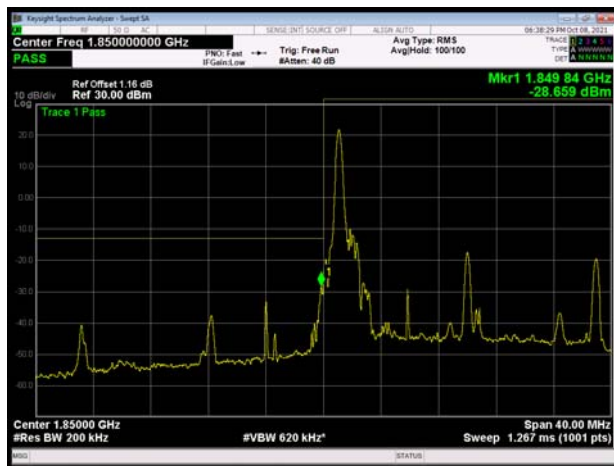
LTE Band 2 15MHz 64QAM 100%RB CH-Low



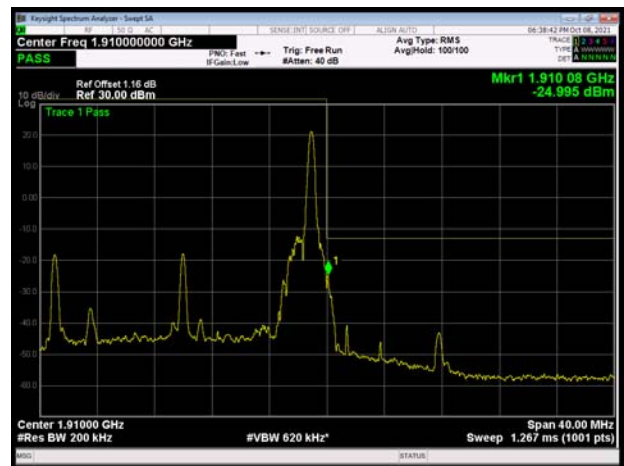
LTE Band 2 15MHz 64QAM 100%RB CH-High



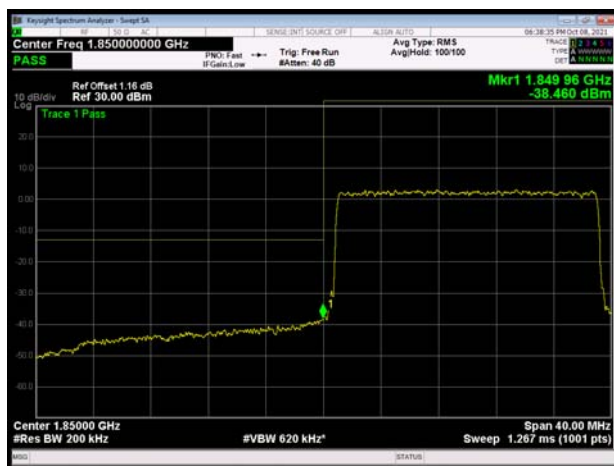
LTE Band 2 20MHz 64QAM 1RB CH-Low



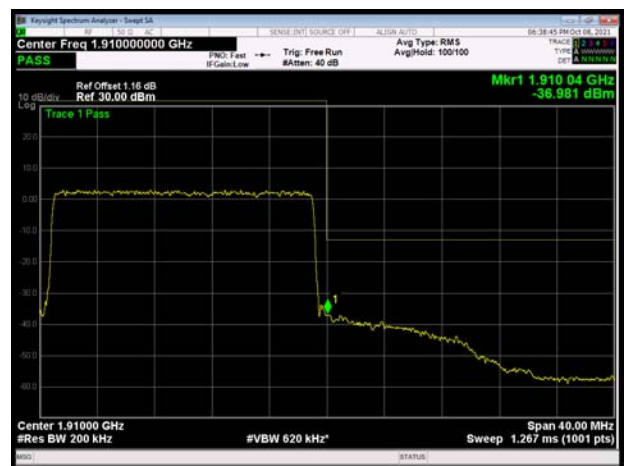
LTE Band 2 20MHz 64QAM 1RB CH-High



LTE Band 2 20MHz 64QAM 100%RB CH-Low



LTE Band 2 20MHz 64QAM 100%RB CH-High



5.4. Peak-to-Average Power Ratio (PAPR)

Ambient condition

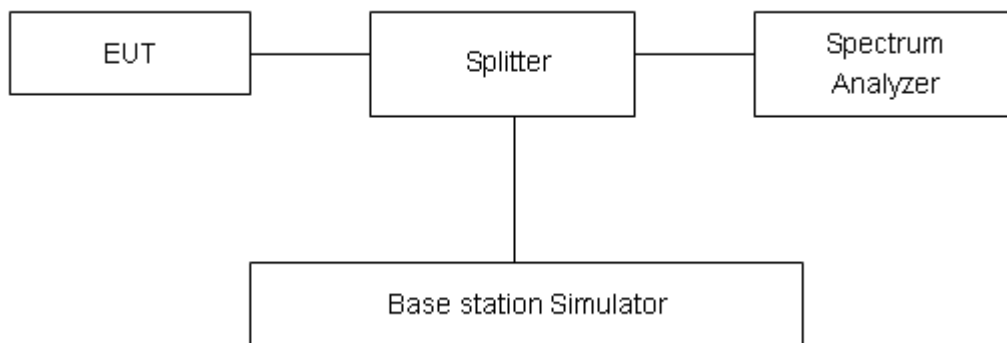
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

Test Setup



Limits

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB in 24.232(d).

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.



Test Results

Mode	Channel	Frequency (MHz)	Peak(dBm)	Avg(dBm)	PAPR(dB)	Limit(dB)	Conclusion
GSM 1900 (GMSK)	512	1850.2	30.50	27.87	2.63	≤13	PASS
	661	1880	30.27	27.64	2.63	≤13	PASS
	810	1909.8	27.78	25.14	2.64	≤13	PASS
GPRS 1900 (GMSK)	512	1850.2	30.45	27.82	2.63	≤13	PASS
	661	1880	30.28	27.65	2.63	≤13	PASS
	810	1909.8	27.83	25.19	2.64	≤13	PASS
EGPRS 1900 (8PSK)	512	1850.2	29.76	23.48	6.28	≤13	PASS
	661	1880	29.50	23.18	6.32	≤13	PASS
	810	1909.8	26.94	20.41	6.53	≤13	PASS
WCDMA Band II (RMC)	9262	1852.4	27.29	24.35	2.94	≤13	PASS
	9400	1880	27.26	24.28	2.98	≤13	PASS
	9538	1907.6	25.17	22.37	2.80	≤13	PASS

LTE Band 2								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	18607	1850.7	27.69	22.80	4.89	≤13	PASS
		18900	1880.0	27.86	22.80	5.06	≤13	PASS
		19193	1909.3	27.34	22.83	4.51	≤13	PASS
	3	18615	1851.5	27.68	22.82	4.86	≤13	PASS
		18900	1880	27.83	22.81	5.02	≤13	PASS
		19185	1908.5	27.50	22.81	4.69	≤13	PASS
	5	18625	1852.5	27.95	22.82	5.13	≤13	PASS
		18900	1880	28.00	22.82	5.18	≤13	PASS
		19175	1907.5	27.70	22.83	4.87	≤13	PASS
	10	18650	1855	28.01	22.84	5.17	≤13	PASS
		18900	1880	28.13	22.86	5.27	≤13	PASS
		19150	1905	27.88	22.86	5.02	≤13	PASS
	15	18675	1857.5	28.39	22.86	5.53	≤13	PASS
		18900	1880	28.50	22.89	5.61	≤13	PASS
		19125	1902.5	28.31	22.92	5.39	≤13	PASS
	20	18700	1860	28.21	22.82	5.39	≤13	PASS
		18900	1880	28.26	22.81	5.45	≤13	PASS
		19100	1900	28.26	22.84	5.42	≤13	PASS
16QAM	1.4	18607	1850.7	27.50	21.78	5.72	≤13	PASS
		18900	1880.0	27.61	21.79	5.82	≤13	PASS



	3	19193	1909.3	27.23	21.80	5.43	≤13	PASS
		18615	1851.5	27.52	21.77	5.75	≤13	PASS
		18900	1880	27.72	21.82	5.90	≤13	PASS
		19185	1908.5	27.35	21.79	5.56	≤13	PASS
	5	18625	1852.5	27.73	21.84	5.89	≤13	PASS
		18900	1880	27.84	21.84	6.00	≤13	PASS
		19175	1907.5	27.51	21.80	5.71	≤13	PASS
	10	18650	1855	27.78	21.82	5.96	≤13	PASS
		18900	1880	27.88	21.84	6.04	≤13	PASS
		19150	1905	27.71	21.88	5.83	≤13	PASS
	15	18675	1857.5	27.95	21.84	6.11	≤13	PASS
		18900	1880	28.02	21.83	6.19	≤13	PASS
		19125	1902.5	27.91	21.89	6.02	≤13	PASS
	20	18700	1860	27.96	21.82	6.14	≤13	PASS
		18900	1880	28.03	21.82	6.21	≤13	PASS
		19100	1900	28.00	21.85	6.15	≤13	PASS
64QAM	1.4	18607	1850.7	26.99	21.28	5.71	≤13	PASS
		18900	1880.0	27.17	21.29	5.88	≤13	PASS
		19193	1909.3	26.79	21.36	5.43	≤13	PASS
	3	18615	1851.5	27.15	21.34	5.81	≤13	PASS
		18900	1880	27.33	21.34	5.99	≤13	PASS
		19185	1908.5	26.97	21.30	5.67	≤13	PASS
	5	18625	1852.5	27.27	21.36	5.91	≤13	PASS
		18900	1880	27.35	21.36	5.99	≤13	PASS
		19175	1907.5	27.06	21.35	5.71	≤13	PASS
	10	18650	1855	27.37	21.37	6.00	≤13	PASS
		18900	1880	27.46	21.38	6.08	≤13	PASS
		19150	1905	27.21	21.39	5.82	≤13	PASS
	15	18675	1857.5	27.50	21.36	6.14	≤13	PASS
		18900	1880	27.56	21.37	6.19	≤13	PASS
		19125	1902.5	27.46	21.40	6.06	≤13	PASS
	20	18700	1860	27.51	21.36	6.15	≤13	PASS
		18900	1880	27.57	21.37	6.20	≤13	PASS
		19100	1900	27.54	21.40	6.14	≤13	PASS

5.5.Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +60°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +60°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

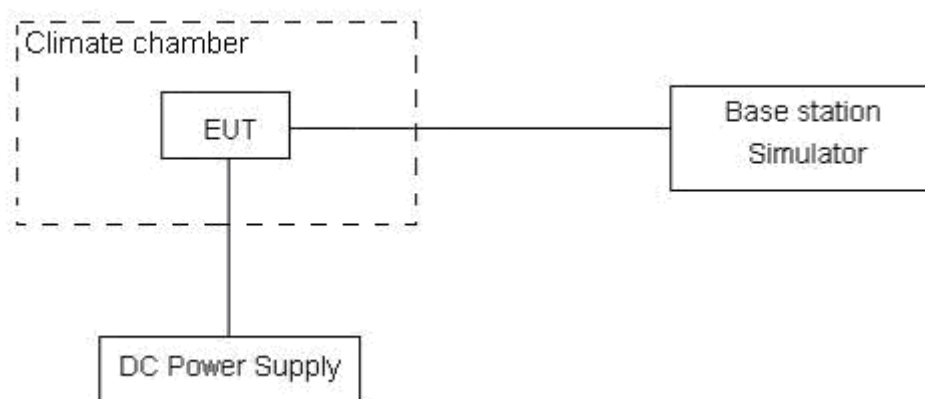
Frequency Stability (Voltage Variation)

The frequency stability shall be measured with variation of primary supply voltage as follows:

Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.60V and 4.45V, with a nominal voltage of 3.87V.

Test setup



Limits

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3$, $U = 0.01\text{ppm}$.

Test Result

	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
	Temperature	Voltage	GMSK	8PSK	GMSK	8PSK	
GSM1900	Normal (25℃)	Normal	3.38	2.64	0.00180	0.00140	PASS
	Extreme (60℃)		4.70	12.65	0.00250	0.00673	PASS
	Extreme (50℃)		13.97	2.23	0.00743	0.00119	PASS
	Extreme (40℃)		6.66	4.53	0.00354	0.00241	PASS
	Extreme (30℃)		2.95	15.19	0.00157	0.00808	PASS
	Extreme (20℃)		10.38	15.95	0.00552	0.00848	PASS
	Extreme (10℃)		8.77	17.96	0.00467	0.00956	PASS
	Extreme (0℃)		3.95	11.48	0.00210	0.00610	PASS
	Extreme (-10℃)		3.51	17.05	0.00187	0.00907	PASS
	Extreme (-20℃)		17.76	9.83	0.00945	0.00523	PASS
	Extreme (-30℃)		4.07	12.08	0.00216	0.00643	PASS
	25℃	LV	14.01	10.54	0.00745	0.00561	PASS
		HV	5.89	12.89	0.00313	0.00685	PASS

	Condition		Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
	Temperature	Voltage	BPSK	QPSK	BPSK	QPSK	
WCDMA B2	Normal (25℃)	Normal	15.83	3.62	0.00842	0.00192	PASS
	Extreme (60℃)		13.25	1.85	0.00705	0.00098	PASS
	Extreme (50℃)		3.91	17.69	0.00208	0.00941	PASS
	Extreme (40℃)		4.05	14.52	0.00215	0.00772	PASS
	Extreme (30℃)		6.33	6.94	0.00336	0.00369	PASS
	Extreme (20℃)		16.24	9.69	0.00864	0.00515	PASS
	Extreme (10℃)		12.97	6.03	0.00690	0.00321	PASS
	Extreme (0℃)		5.67	15.27	0.00302	0.00812	PASS
	Extreme (-10℃)		2.88	11.79	0.00153	0.00627	PASS
	Extreme (-20℃)		6.51	3.66	0.00346	0.00195	PASS
	Extreme (-30℃)		3.34	14.21	0.00177	0.00756	PASS
	25℃	LV	1.33	16.29	0.00071	0.00866	PASS
		HV	7.12	16.49	0.00379	0.00877	PASS



LTE Band 2								
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	1.4MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	3.75	14.60	17.42	0.00200	0.00777	0.00927	PASS
Extreme (60℃)		15.67	4.47	6.93	0.00833	0.00238	0.00369	PASS
Extreme (50℃)		4.03	6.68	17.73	0.00215	0.00355	0.00943	PASS
Extreme (40℃)		17.42	14.42	2.42	0.00927	0.00767	0.00129	PASS
Extreme (30℃)		8.95	1.26	15.23	0.00476	0.00067	0.00810	PASS
Extreme (20℃)		5.79	12.11	9.83	0.00308	0.00644	0.00523	PASS
Extreme (10℃)		11.68	15.48	7.90	0.00621	0.00823	0.00420	PASS
Extreme (0℃)		6.48	1.42	12.01	0.00344	0.00075	0.00639	PASS
Extreme (-10℃)		14.54	2.51	10.99	0.00774	0.00134	0.00584	PASS
Extreme (-20℃)		13.77	2.11	16.72	0.00733	0.00112	0.00890	PASS
Extreme (-30℃)	12.83	1.92	12.82	0.00682	0.00102	0.00682	PASS	
25℃	LV	3.55	2.36	5.15	0.00189	0.00125	0.00274	PASS
	HV	6.36	2.59	17.33	0.00338	0.00138	0.00922	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	3MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	10.28	10.08	14.35	0.00547	0.00536	0.00763	PASS
Extreme (60℃)		6.37	5.70	3.43	0.00339	0.00303	0.00182	PASS
Extreme (50℃)		1.89	1.24	8.96	0.00101	0.00066	0.00476	PASS
Extreme (40℃)		4.37	10.67	5.79	0.00233	0.00568	0.00308	PASS
Extreme (30℃)		17.96	14.45	14.44	0.00955	0.00768	0.00768	PASS
Extreme (20℃)		12.56	11.39	8.82	0.00668	0.00606	0.00469	PASS
Extreme (10℃)		3.99	12.13	3.94	0.00212	0.00645	0.00209	PASS
Extreme (0℃)		9.42	3.76	9.15	0.00501	0.00200	0.00487	PASS
Extreme (-10℃)		10.31	11.63	13.26	0.00548	0.00619	0.00705	PASS
Extreme (-20℃)		6.30	14.57	17.76	0.00335	0.00775	0.00945	PASS
Extreme (-30℃)	10.70	10.14	13.32	0.00569	0.00540	0.00708	PASS	
25℃	LV	5.64	8.19	12.81	0.00300	0.00436	0.00681	PASS
	HV	2.27	6.35	14.00	0.00121	0.00338	0.00745	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	5MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	11.12	10.97	11.36	0.00591	0.00584	0.00604	PASS
Extreme (60℃)		14.79	15.90	6.57	0.00787	0.00846	0.00349	PASS
Extreme (50℃)		7.69	1.79	10.77	0.00409	0.00095	0.00573	PASS



Extreme (40℃)		6.16	1.61	17.30	0.00327	0.00086	0.00920	PASS
Extreme (30℃)		1.78	11.07	12.98	0.00095	0.00589	0.00690	PASS
Extreme (20℃)		7.85	2.78	3.77	0.00417	0.00148	0.00201	PASS
Extreme (10℃)		17.79	11.83	4.08	0.00946	0.00629	0.00217	PASS
Extreme (0℃)		6.01	5.16	10.20	0.00320	0.00274	0.00542	PASS
Extreme (-10℃)		4.38	8.94	5.79	0.00233	0.00476	0.00308	PASS
Extreme (-20℃)		4.56	16.13	11.18	0.00242	0.00858	0.00595	PASS
Extreme (-30℃)		3.49	4.07	2.71	0.00186	0.00217	0.00144	PASS
25℃	LV	14.96	16.14	14.97	0.00796	0.00858	0.00796	PASS
	HV	15.58	7.15	4.80	0.00829	0.00380	0.00255	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	10MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	15.73	12.69	11.56	0.00836	0.00675	0.00615	PASS
Extreme (60℃)		3.78	17.44	3.69	0.00201	0.00928	0.00196	PASS
Extreme (50℃)		5.05	17.00	17.23	0.00269	0.00904	0.00917	PASS
Extreme (40℃)		10.27	5.70	10.48	0.00546	0.00303	0.00557	PASS
Extreme (30℃)		10.98	7.18	7.57	0.00584	0.00382	0.00403	PASS
Extreme (20℃)		8.44	3.40	4.47	0.00449	0.00181	0.00238	PASS
Extreme (10℃)		5.63	14.40	15.58	0.00300	0.00766	0.00829	PASS
Extreme (0℃)		16.11	9.76	3.30	0.00857	0.00519	0.00176	PASS
Extreme (-10℃)		10.99	12.48	12.07	0.00585	0.00664	0.00642	PASS
Extreme (-20℃)		17.24	16.56	8.73	0.00917	0.00881	0.00464	PASS
Extreme (-30℃)		4.03	1.55	8.28	0.00214	0.00083	0.00440	PASS
25℃	LV	15.72	11.30	5.91	0.00836	0.00601	0.00314	PASS
	HV	12.62	1.41	12.27	0.00671	0.00075	0.00652	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	15MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	8.26	2.75	12.00	0.00439	0.00146	0.00638	PASS
Extreme (60℃)		17.17	4.94	15.87	0.00913	0.00263	0.00844	PASS
Extreme (50℃)		1.42	17.81	10.88	0.00075	0.00947	0.00579	PASS
Extreme (40℃)		14.20	4.46	2.03	0.00755	0.00237	0.00108	PASS
Extreme (30℃)		2.80	4.87	13.55	0.00149	0.00259	0.00721	PASS
Extreme (20℃)		1.44	1.65	4.59	0.00077	0.00088	0.00244	PASS
Extreme (10℃)		3.71	13.88	6.31	0.00197	0.00738	0.00336	PASS
Extreme (0℃)		11.93	4.21	9.57	0.00634	0.00224	0.00509	PASS
Extreme (-10℃)		7.65	1.50	17.42	0.00407	0.00080	0.00926	PASS
Extreme (-20℃)		15.66	1.44	11.07	0.00833	0.00077	0.00589	PASS
Extreme (-30℃)		17.18	5.86	3.42	0.00914	0.00312	0.00182	PASS
25℃	LV	2.44	6.07	14.81	0.00130	0.00323	0.00788	PASS



	HV	2.76	3.60	12.22	0.00147	0.00191	0.00650	PASS
Condition		Freq.Error (Hz)	Freq.Error (Hz)	Freq.Error (Hz)	Frequency Stability (ppm)	Frequency Stability (ppm)	Frequency Stability (ppm)	Verdict
BANDWIDTH	20MHz							
Temperature	Voltage	64QAM	16QAM	QPSK	64QAM	16QAM	QPSK	
Normal (25℃)	Normal	1.24	8.19	11.92	0.00066	0.00435	0.00634	PASS
Extreme (60℃)		2.25	14.54	6.87	0.00120	0.00773	0.00366	PASS
Extreme (50℃)		3.95	13.05	3.17	0.00210	0.00694	0.00168	PASS
Extreme (40℃)		10.76	15.62	11.30	0.00572	0.00831	0.00601	PASS
Extreme (30℃)		9.04	4.50	15.11	0.00481	0.00239	0.00804	PASS
Extreme (20℃)		4.93	10.50	14.89	0.00262	0.00558	0.00792	PASS
Extreme (10℃)		8.62	7.08	3.42	0.00458	0.00377	0.00182	PASS
Extreme (0℃)		12.08	16.50	14.66	0.00642	0.00878	0.00780	PASS
Extreme (-10℃)		3.05	4.47	5.26	0.00162	0.00238	0.00280	PASS
Extreme (-20℃)		9.03	8.09	13.59	0.00480	0.00431	0.00723	PASS
Extreme (-30℃)		2.43	10.24	14.73	0.00129	0.00545	0.00784	PASS
25℃	LV	13.77	11.63	4.71	0.00733	0.00618	0.00250	PASS
	HV	6.01	6.47	14.01	0.00320	0.00344	0.00745	PASS

5.6. Spurious Emissions at Antenna Terminals

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 9kHz to the 10th harmonic of the carrier. The peak detector is used.

RBW is set to 100kHz, VBW is set to 300kHz for 30MHz~1GHz

RBW is set to 1MHz, VBW is set to 3MHz for above 1GHz, Sweep is set to ATUO.

RBW is set to 1 kHz (0.009MHz~ 0.15 MHz),

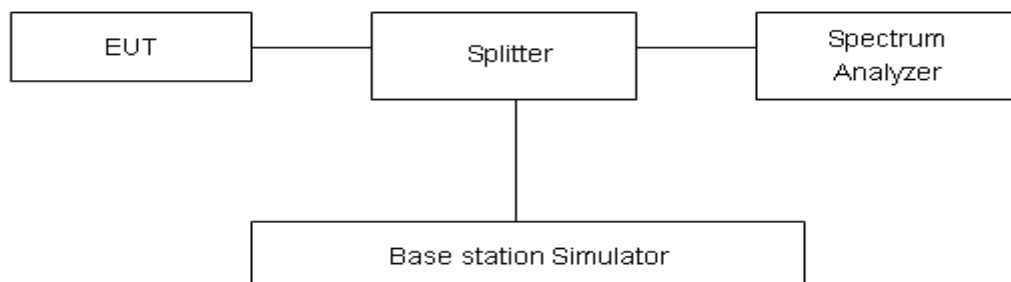
RBW is set to 10 kHz (0.15 MHz~ 30 MHz)

RBW is set to 100 kHz (30MHz~1000 MHz)

RBW is set to 1000 kHz (above 1000MHz)

The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup



Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

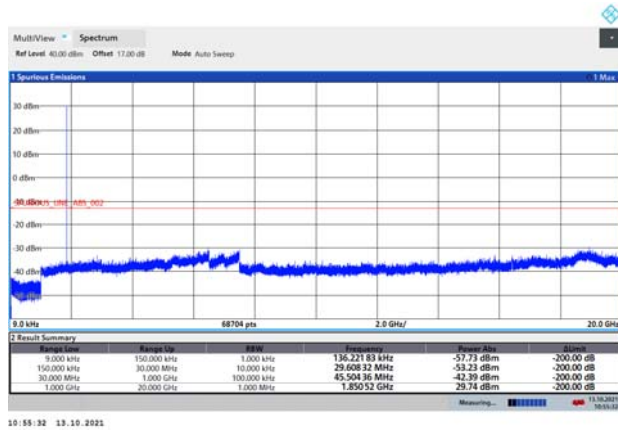
Frequency	Uncertainty
9kHz-1GHz	0.684 dB
1GHz-20GHz	1.407 dB

Test Result

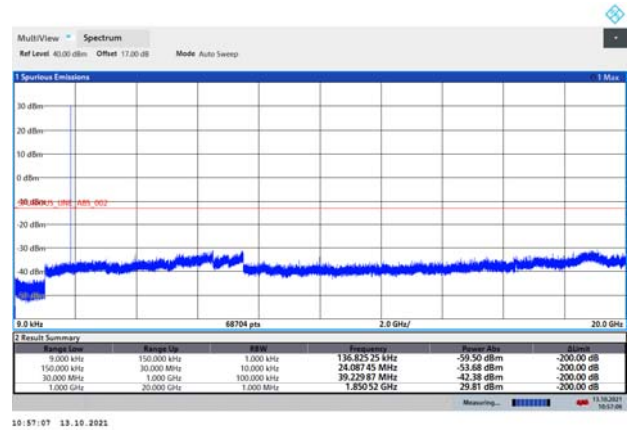
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions more than 20 dB below the limit are not reported.

The signal beyond the limit is carrier.

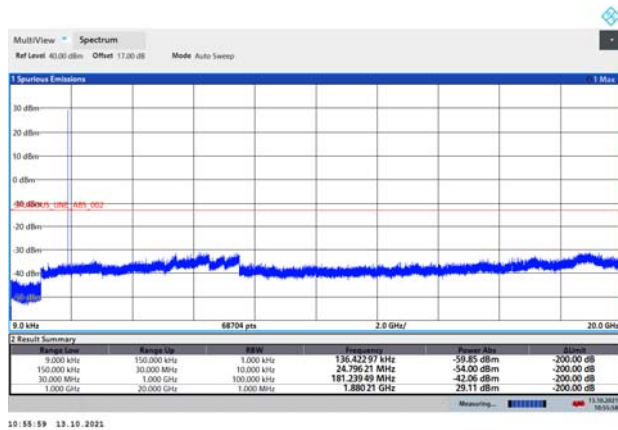
GSM 1900 CH-Low 9kHz ~ 20GHz



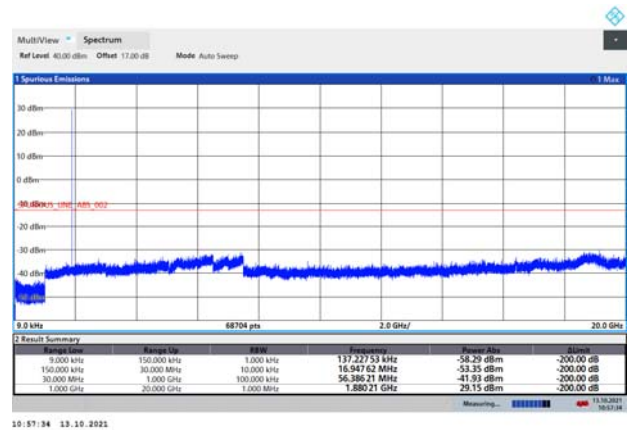
GPRS 1900 CH-Low 9kHz ~ 20GHz



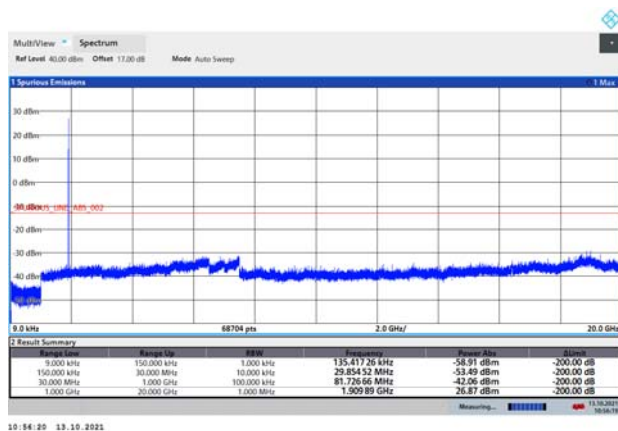
GSM 1900 CH- Middle 9kHz ~ 20GHz



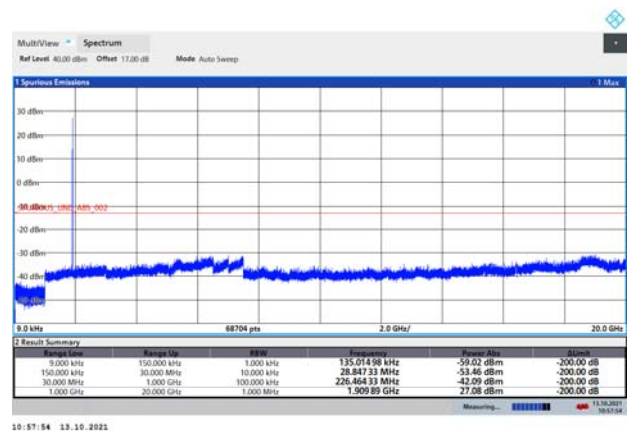
GPRS 1900 CH- Middle 9kHz ~ 20GHz



GSM 1900 CH-High 9kHz ~ 20GHz

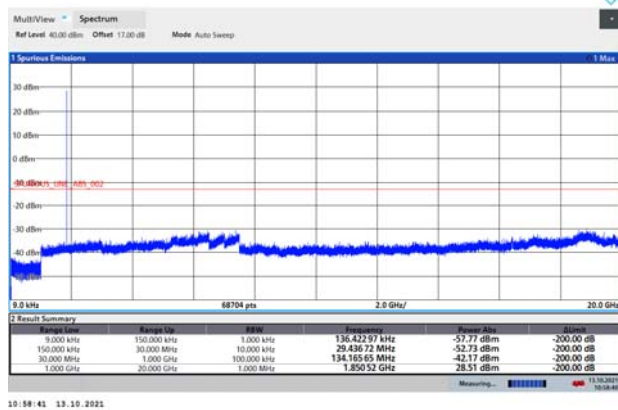


GPRS 1900 CH-High 9kHz ~ 20GHz



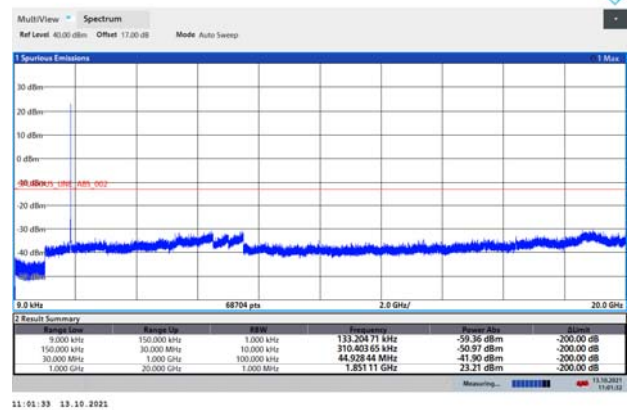


EGPRS 1900 CH-Low 9kHz ~ 20GHz



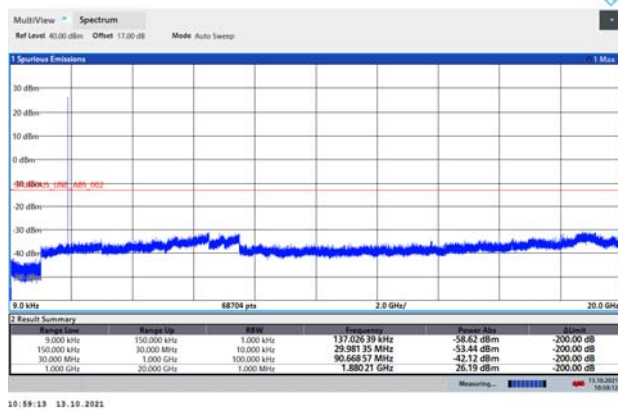
10:59:41 13.10.2021

WCDMA BAND II CH-Low 9kHz ~ 20GHz



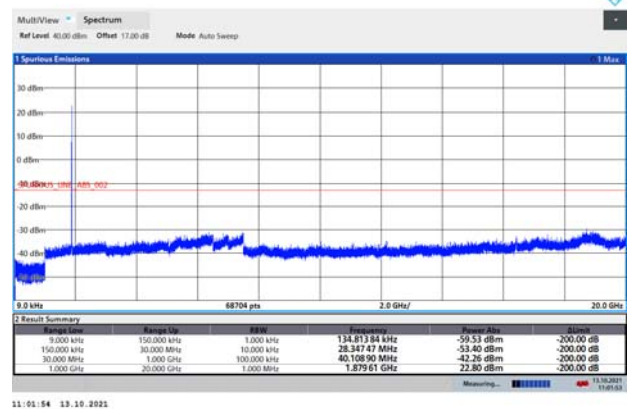
11:01:39 13.10.2021

EGPRS 1900 CH- Middle 9kHz ~ 20GHz



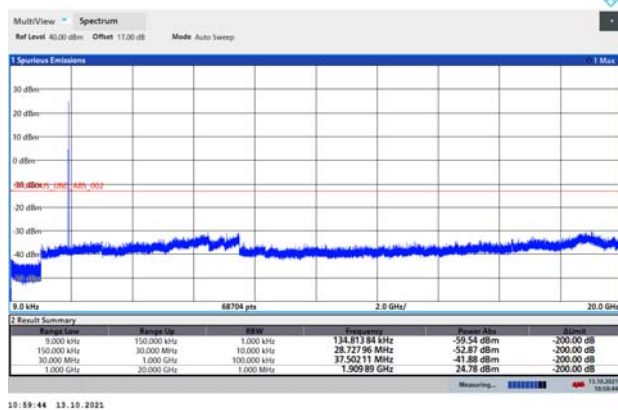
10:59:13 13.10.2021

WCDMA BAND II CH- Middle 9kHz ~ 20GHz



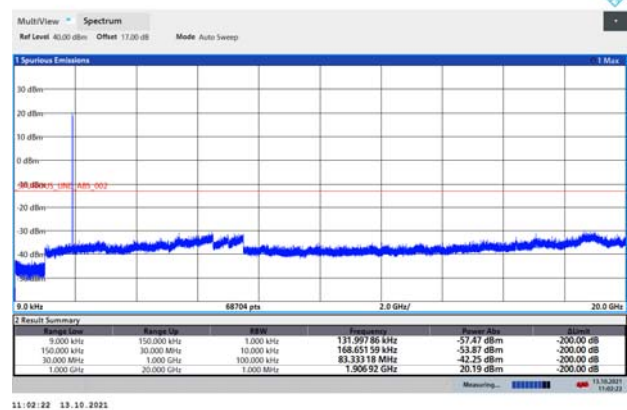
11:01:54 13.10.2021

EGPRS 1900 CH-High 9kHz ~ 20GHz



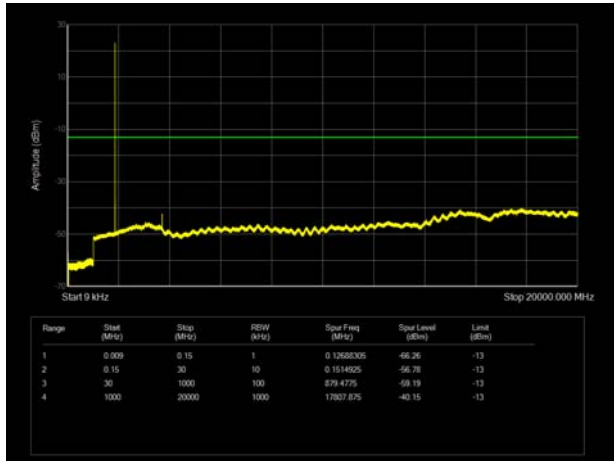
10:59:44 13.10.2021

WCDMA BAND II CH-High 9kHz ~ 20GHz

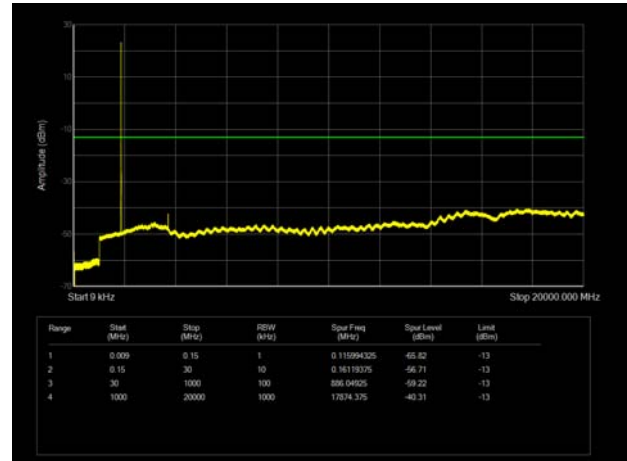


11:02:22 13.10.2021

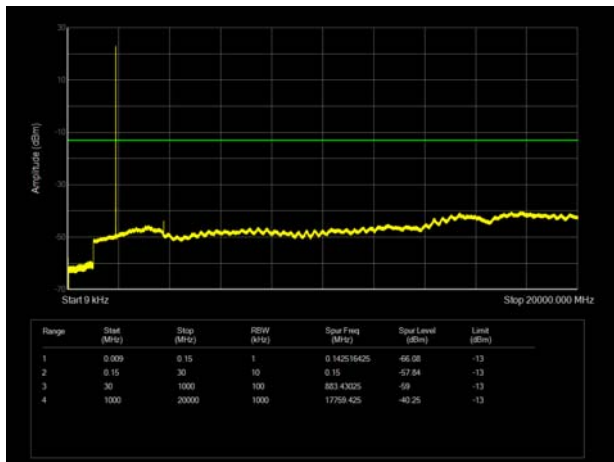
LTE Band 2 1.4MHz CH-Low 9kHz~20GHz



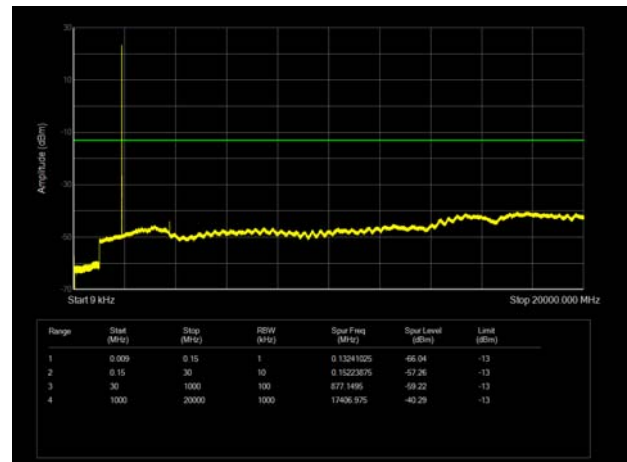
LTE Band 2 3MHz CH-Low 9kHz~20GHz



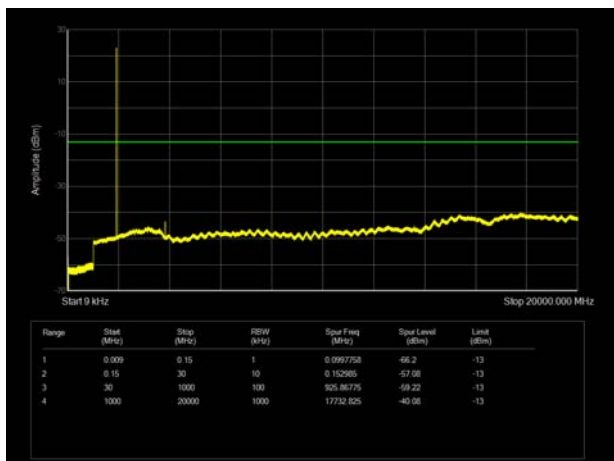
LTE Band 2 1.4MHz CH-Middle 9kHz~20GHz



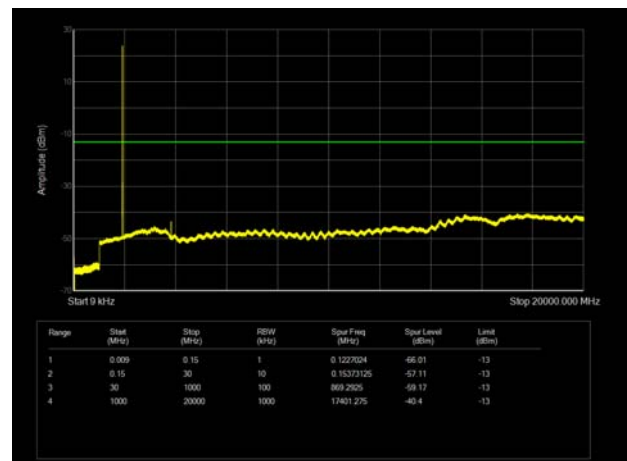
LTE Band 2 3MHz CH-Middle 9kHz~20GHz



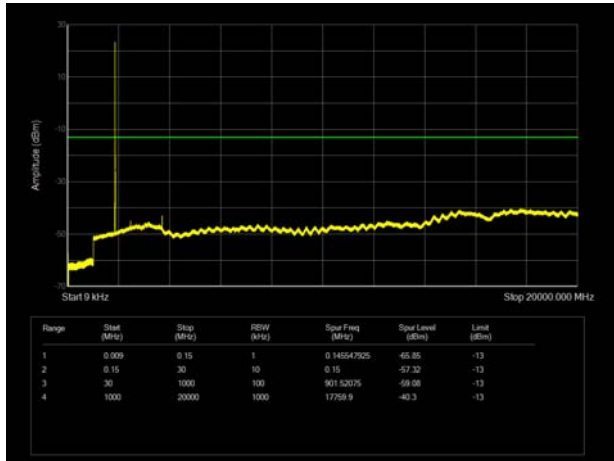
LTE Band 2 1.4MHz CH-High 9kHz~20GHz



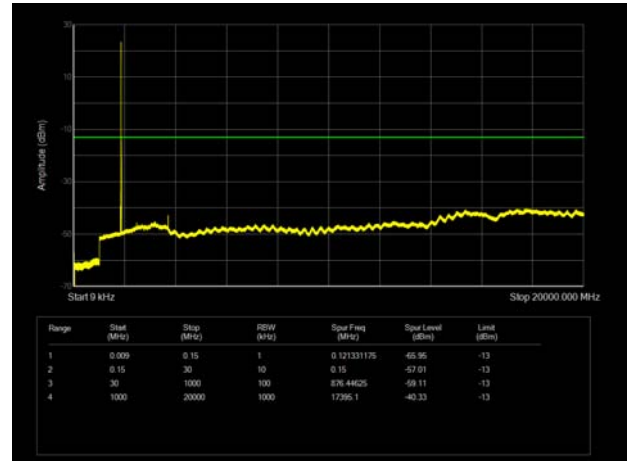
LTE Band 2 3MHz CH-High 9kHz~20GHz



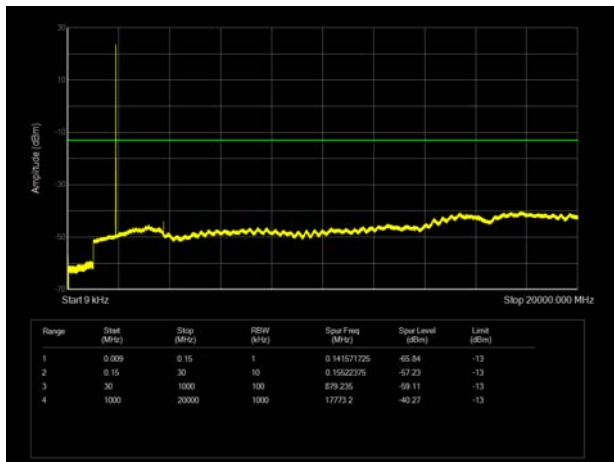
LTE Band 2 5MHz CH-Low 9kHz~20GHz



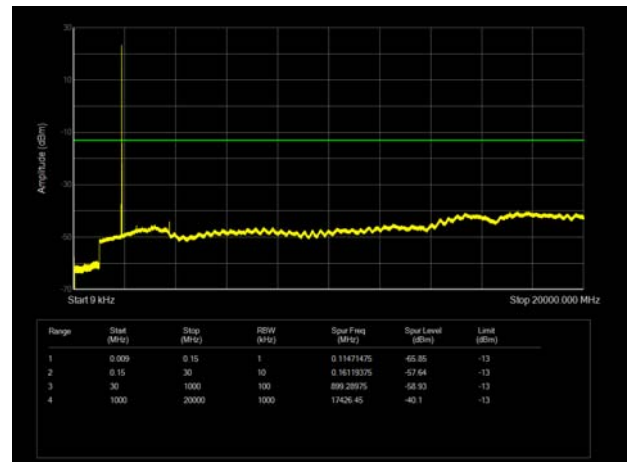
LTE Band 2 10MHz CH-Low 9kHz~20GHz



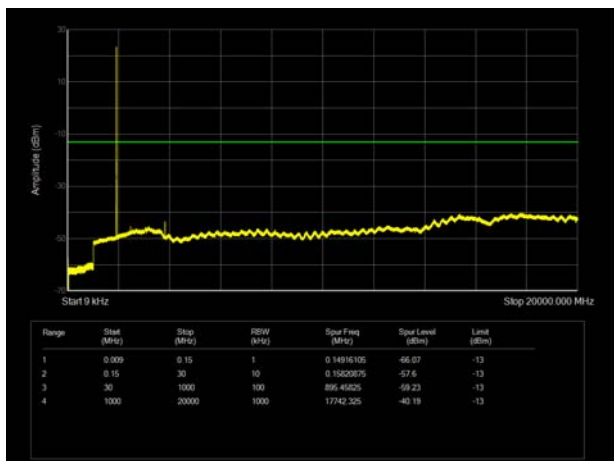
LTE Band 2 5MHz CH-Middle 9kHz~20GHz



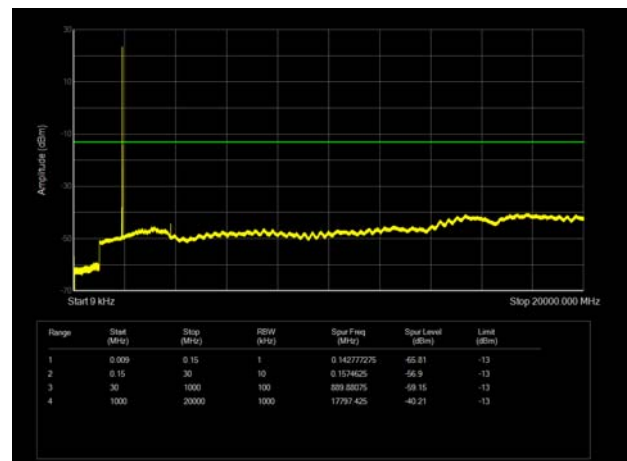
LTE Band 2 10MHz CH-Middle 9kHz~20GHz



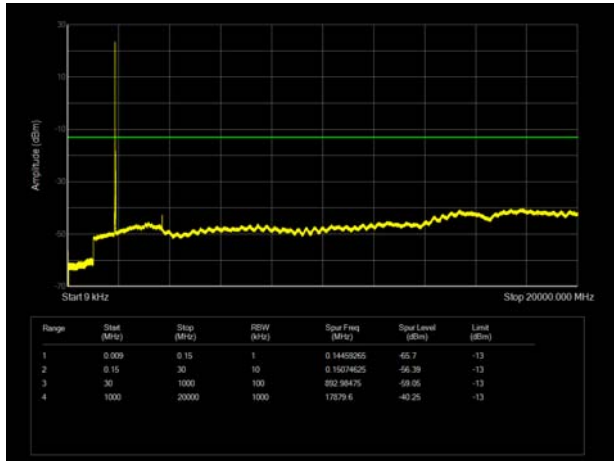
LTE Band 2 5MHz CH-High 9kHz~20GHz



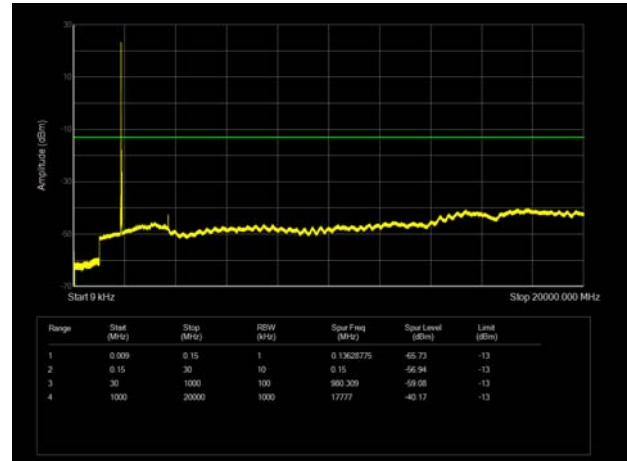
LTE Band 2 10MHz CH-High 9kHz~20GHz



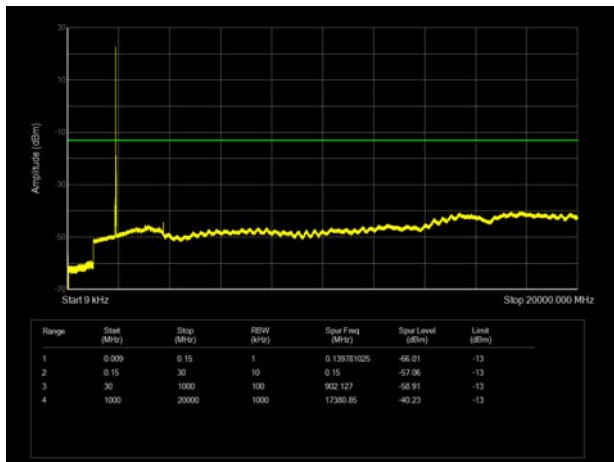
LTE Band 2 15MHz CH-Low 9kHz~20GHz



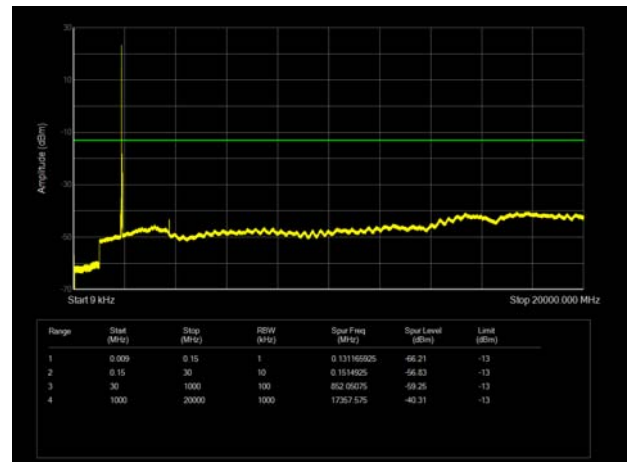
LTE Band 2 20MHz CH-Low 9kHz~20GHz



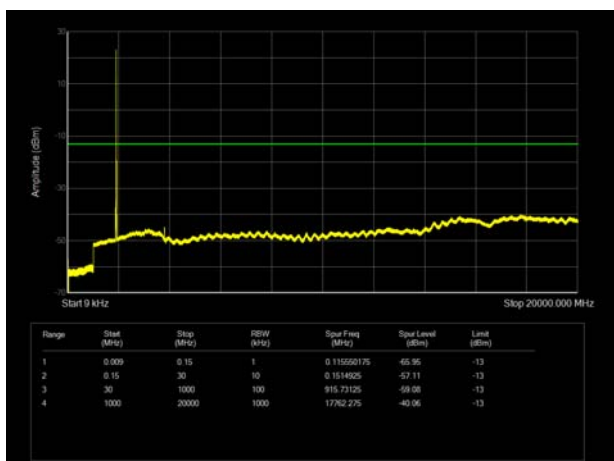
LTE Band 2 15MHz CH-Middle 9kHz~20GHz



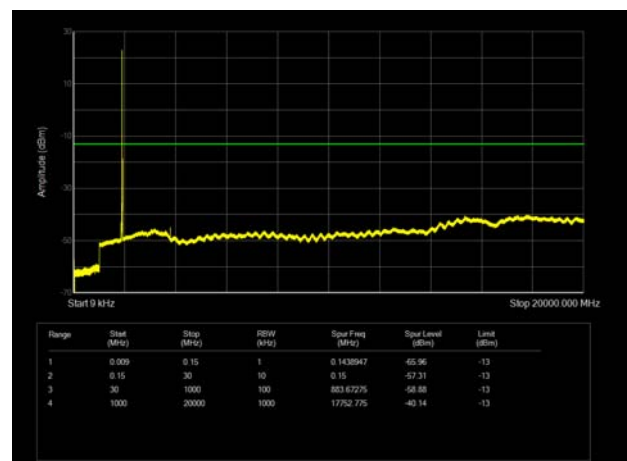
LTE Band 2 20MHz CH-Middle 9kHz~20GHz



LTE Band 2 15MHz CH-High 9kHz~20GHz



LTE Band 2 20MHz CH-High 9kHz~20GHz



5.7. Radiates Spurious Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. The testing follows FCC KDB 971168 v03r01 Section 5.8 and ANSI C63.26 (2015).
2. Below 1GHz: The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H). Above 1GHz: (Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A loop antenna, A log-periodic antenna or horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:

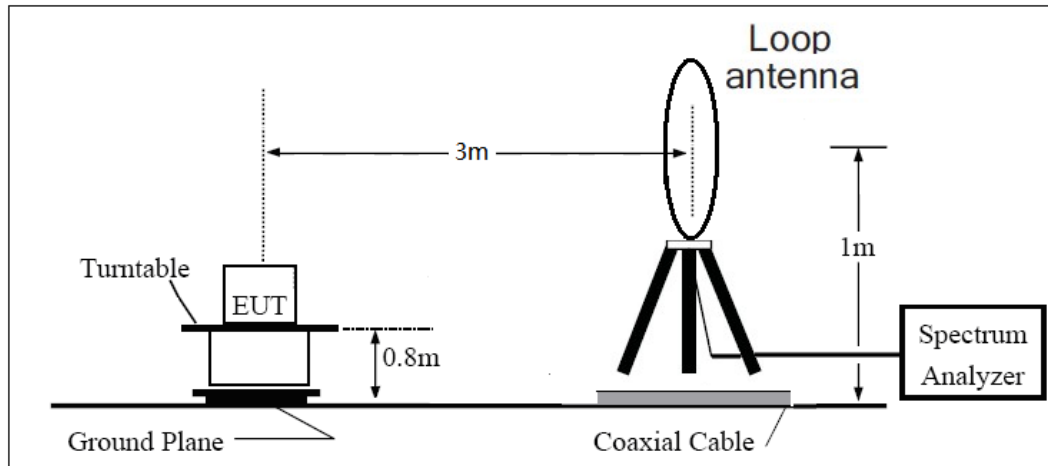
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP

= EIRP-2.15dB.

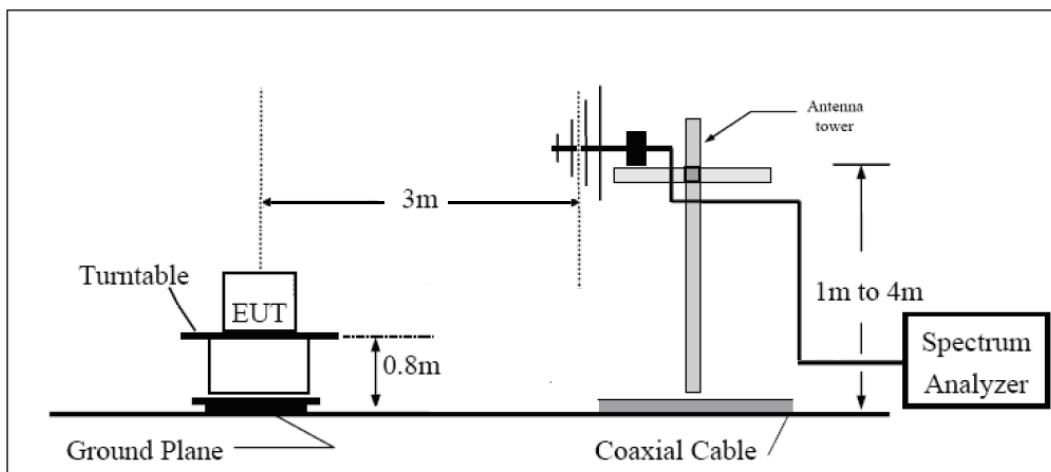
The modulation mode and RB allocation refer to section 5.1, using the maximum output power configuration.

Test setup

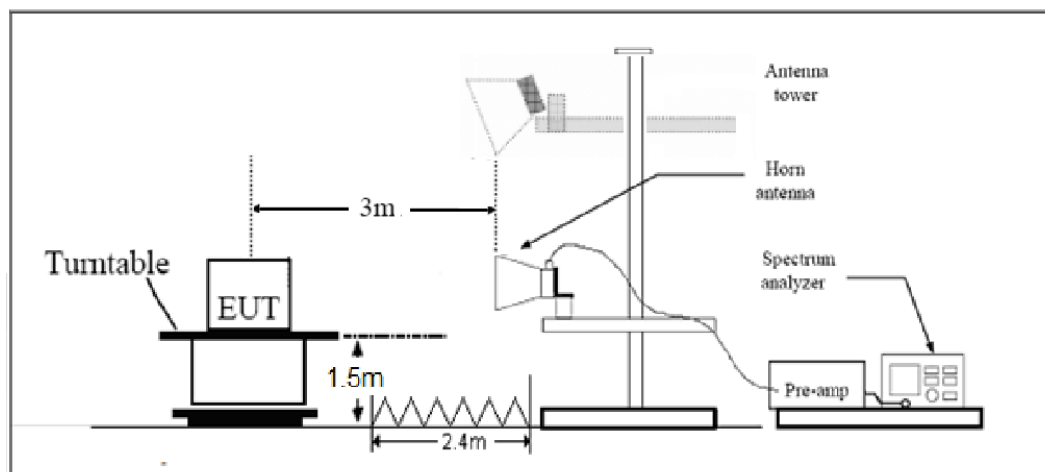
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side: 2.4mX3.6m

Limits

Rule Part 24.238(a) specifies that “on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10} (P)$ dB.”

Limit	-13 dBm
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Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

Test Result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the emissions below the noise floor will not be recorded in the report.

Low Antenna

GSM 1900 CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-60.52	2.60	12.50	Horizontal	-50.62	-13.00	37.62	90
3	5640.00	-56.62	3.30	12.50	Horizontal	-47.42	-13.00	34.42	45
4	7520.00	-56.45	4.20	12.20	Horizontal	-48.45	-13.00	35.45	90
5	9400.00	-52.41	4.30	11.10	Horizontal	-45.61	-13.00	32.61	45
6	11280.00	-50.26	5.90	11.90	Horizontal	-44.26	-13.00	31.26	0
7	13160.00	-53.75	5.70	14.00	Horizontal	-45.45	-13.00	32.45	0
8	15040.00	-51.62	5.80	13.10	Horizontal	-44.32	-13.00	31.32	90
9	16920.00	-50.86	6.10	14.60	Horizontal	-42.36	-13.00	29.36	45
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

WCDMA Band II CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-57.46	2.60	12.50	Horizontal	-47.56	-13.00	34.56	0
3	5640.00	-64.93	3.30	12.50	Horizontal	-55.73	-13.00	42.73	180
4	7520.00	-56.41	4.20	12.20	Horizontal	-48.41	-13.00	35.41	180
5	9400.00	-53.57	4.30	11.10	Horizontal	-46.77	-13.00	33.77	45
6	11280.00	-50.12	5.90	11.90	Horizontal	-44.12	-13.00	31.12	225
7	13160.00	-52.44	5.70	14.00	Horizontal	-44.14	-13.00	31.14	225
8	15040.00	-53.51	5.80	13.10	Horizontal	-46.21	-13.00	33.21	135
9	16920.00	-50.85	6.10	14.60	Horizontal	-42.35	-13.00	29.35	45
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 2 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.00	-56.34	2.60	12.50	Vertical	-46.44	-13.00	33.44	0
3	5638.88	-55.41	3.30	12.50	Vertical	-46.21	-13.00	33.21	315
4	7520.00	-58.74	4.20	12.20	Vertical	-50.74	-13.00	37.74	45
5	9400.00	-53.76	4.30	11.10	Vertical	-46.96	-13.00	33.96	225
6	11280.00	-50.79	5.90	11.90	Vertical	-44.79	-13.00	31.79	90
7	13160.00	-53.32	5.70	14.00	Vertical	-45.02	-13.00	32.02	180
8	15040.00	-53.73	5.80	13.10	Vertical	-46.43	-13.00	33.43	135
9	16920.00	-53.22	6.10	14.60	Vertical	-44.72	-13.00	31.72	90
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Vertical position.

LTE Band 2 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3755.63	-57.01	2.60	12.50	Vertical	-47.11	-13.00	34.11	45
3	5632.50	-55.95	3.30	12.50	Vertical	-46.75	-13.00	33.75	0
4	7510.00	-58.53	4.20	12.20	Vertical	-50.53	-13.00	37.53	225
5	9387.50	-52.76	4.30	11.10	Vertical	-45.96	-13.00	32.96	270
6	11265.00	-50.12	5.90	11.90	Vertical	-44.12	-13.00	31.12	180
7	13142.50	-52.44	5.70	14.00	Vertical	-44.14	-13.00	31.14	225
8	15020.00	-53.59	5.80	13.10	Vertical	-46.29	-13.00	33.29	135
9	16897.50	-51.70	6.10	14.60	Vertical	-43.20	-13.00	30.20	0
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Vertical position.

LTE Band 2 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3740.00	-58.44	2.60	12.50	Vertical	-48.54	-13.00	35.54	45
3	5610.00	-54.30	3.30	12.50	Vertical	-45.10	-13.00	32.10	90
4	7480.00	-59.43	4.20	12.20	Vertical	-51.43	-13.00	38.43	225
5	9350.00	-54.24	4.30	11.10	Vertical	-47.44	-13.00	34.44	315
6	11220.00	-52.50	5.90	11.90	Vertical	-46.50	-13.00	33.50	180
7	13090.00	-53.46	5.70	14.00	Vertical	-45.16	-13.00	32.16	90
8	14960.00	-52.71	5.80	13.10	Vertical	-45.41	-13.00	32.41	45
9	16830.00	-51.46	6.10	14.60	Vertical	-42.96	-13.00	29.96	135
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Vertical position.

Upper Antenna

GSM 1900 CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-68.06	2.60	12.50	Horizontal	-58.16	-13.00	45.16	90
3	5640.00	-64.37	3.30	12.50	Horizontal	-55.17	-13.00	42.17	180
4	7520.00	-57.22	4.20	12.20	Horizontal	-49.22	-13.00	36.22	0
5	9400.00	-52.30	4.30	11.10	Horizontal	-45.50	-13.00	32.50	135
6	11280.00	-49.16	5.90	11.90	Horizontal	-43.16	-13.00	30.16	225
7	13160.00	-54.91	5.70	14.00	Horizontal	-46.61	-13.00	33.61	45
8	15040.00	-55.86	5.80	13.10	Horizontal	-48.56	-13.00	35.56	0
9	16920.00	-56.79	6.10	14.60	Horizontal	-48.29	-13.00	35.29	315
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

WCDMA Band II CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3760.00	-66.02	2.60	12.50	Horizontal	-56.12	-13.00	43.12	0
3	5640.00	-66.63	3.30	12.50	Horizontal	-57.43	-13.00	44.43	270
4	7520.00	-59.30	4.20	12.20	Horizontal	-51.30	-13.00	38.30	135
5	9400.00	-53.54	4.30	11.10	Horizontal	-46.74	-13.00	33.74	45
6	11280.00	-51.42	5.90	11.90	Horizontal	-45.42	-13.00	32.42	225
7	13160.00	-55.85	5.70	14.00	Horizontal	-47.55	-13.00	34.55	0
8	15040.00	-56.13	5.80	13.10	Horizontal	-48.83	-13.00	35.83	135
9	16920.00	-57.27	6.10	14.60	Horizontal	-48.77	-13.00	35.77	315
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 2 1.4MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3759.00	-54.13	2.60	12.50	Horizontal	-44.23	-13.00	31.23	0
3	5638.88	-66.90	3.30	12.50	Horizontal	-57.70	-13.00	44.70	315
4	7520.00	-60.27	4.20	12.20	Horizontal	-52.27	-13.00	39.27	45
5	9400.00	-54.38	4.30	11.10	Horizontal	-47.58	-13.00	34.58	225
6	11280.00	-50.18	5.90	11.90	Horizontal	-44.18	-13.00	31.18	90
7	13160.00	-56.82	5.70	14.00	Horizontal	-48.52	-13.00	35.52	180
8	15040.00	-58.02	5.80	13.10	Horizontal	-50.72	-13.00	37.72	135
9	16920.00	-59.88	6.10	14.60	Horizontal	-51.38	-13.00	38.38	90
10	--	--	--	--	--	--	--	--	--

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

LTE Band 2 5MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3755.63	-50.95	2.60	12.50	Horizontal	-41.05	-13.00	28.05	45
3	5633.63	-65.96	3.30	12.50	Horizontal	-56.76	-13.00	43.76	0
4	7520.00	-57.57	4.20	12.20	Horizontal	-49.57	-13.00	36.57	225
5	9400.00	-53.84	4.30	11.10	Horizontal	-47.04	-13.00	34.04	270
6	11280.00	-49.49	5.90	11.90	Horizontal	-43.49	-13.00	30.49	180
7	13160.00	-52.76	5.70	14.00	Horizontal	-44.46	-13.00	31.46	225
8	15040.00	-53.90	5.80	13.10	Horizontal	-46.60	-13.00	33.60	135
9	16920.00	-51.26	6.10	14.60	Horizontal	-42.76	-13.00	29.76	0
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Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.



LTE Band 2 20MHz CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	EIRP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	3742.13	-52.13	2.60	12.50	Horizontal	-42.23	-13.00	29.23	45
3	5613.38	-66.25	3.30	12.50	Horizontal	-57.05	-13.00	44.05	90
4	7484.63	-57.45	4.20	12.20	Horizontal	-49.45	-13.00	36.45	225
5	9400.00	-54.51	4.30	11.10	Horizontal	-47.71	-13.00	34.71	315
6	11280.00	-49.37	5.90	11.90	Horizontal	-43.37	-13.00	30.37	180
7	13160.00	-52.04	5.70	14.00	Horizontal	-43.74	-13.00	30.74	90
8	15040.00	-53.51	5.80	13.10	Horizontal	-46.21	-13.00	33.21	45
9	16920.00	-52.27	6.10	14.60	Horizontal	-43.77	-13.00	30.77	135
10	--	--	--	--	--	--	--	--	--

Note: 1. The other Spurious RF Radiated emissions level is no more than noise floor.

2. The worst emission was found in the antenna is Horizontal position.

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Base Station Simulator	R&S	CMW500	113824	2021-05-15	2022-05-14
Climate Chamber	Weiss	VT4002	58226119450010	2021-05-15	2022-05-14
Spectrum Analyzer	Key sight	N9020	MY52330084	2021-05-15	2022-05-14
Universal Radio Communication Tester	Key sight	E5515C	MY48367192	2021-05-15	2022-05-14
Signal Analyzer	R&S	FSV3030	101411	2020-12-13	2021-12-12
Signal Analyzer	R&S	FSV30	100815	2020-12-13	2021-12-12
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	01111	2019-9-12	2022-09-11
Horn Antenna	Schwarzbeck	BBHA 9120D	1594	2020-12-17	2021-12-16

*****END OF REPORT *****



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.